United States Court of Appeals
for the Second Circuit

EXHIBITS

UNITED STATES
DEPARTMENT OF THE INTERIOR

Satlow

77-6049 B

FINAL

ENVIRONMENTAL STATEMENT

VOLUME 2 OF 3

EXHIBIT

PROPOSED

INCREASE IN OIL AND GAS LEASING ON THE OUTER CONTINENTAL SHELF

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III. ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

A. Introduction and Methodological Overview

The purpose of this Section is to identify the impacts on the natural environment, and the various coastal zone resources, on air and water quality, on land use patterns and on the social order which might result from the proposed acceleration of Outer Continental Shelf oil and gas leasing. Since this is a programmatic statement, the focus of this discussion of impacts is on the general or programmatic impacts and not on the specific impacts in any particular area. Therefore, much of this Section deals with a general discussion of the sources of impact-generating effluents upon broad groups of resources. The environmental impacts in any given area will be addressed only in general terms. Identification of the specific impacts in each area will be further addressed in site-specific EIS's.

This analysis of the possible environmental impacts of accelerating leasing of OCS oil and gas resources is based upon the following specific elements of the accelerated OCS leasing proposal:

> Six OCS lease sales in 1975, i.e. South Texas, two in Central Gulf, Southern California, State-Federal Cook Inlet, and the Gulf of Alaska.

Beyond 1975, OCS lease sales are presented in the Proposed OCS Planning Schedule of June 1975, (page 2, Section I) i.e. six sales a year in 1976, 1977, and 1978, a sale in each of the 17 OCS areas by the end of 1978.

The baseline studies and other OCS related research and management activities as described in Section I of this statement.

The U.S. Geological Survey has estimated the undiscovered recoverable resources of oil and gas for each of the 17 U. S. Continental Shelf areas and 5 of the 17 Continental Slope area. These estimates, along with production profiles and facility requirements for each area, are shown in Table 106. This information is the basis for quantifying moderate and extreme levels of environmental impacts to be expected if the estimated hydrocarbon resource is discovered and developed. The estimates of undiscovered recoverable resources presented in Table 106 are for all Continental Slope areas. Estimates of undiscovered recoverable resources for the areas that might be leased are not identified at this time. The proposed lease schedule between 1975 and 1978 will not lease the entire resource base of any of the OCS areas, however. Thus use of these estimates of total undiscovered recoverable resources to predict the

OCS AREA
No. Atlantic
Mid. Atlantic
So. Atlantic
MAFLA
Central Gulf of Mexic
South Texas 6/
So. California
Santa Barbara
No. California
Washington-Oregon
Cook Inlet
Gulf of Alaska 7/
Aleutian Shelf
Bristol Basin
Bering Sea
Chukchi Sea
Beaufort Sea
Totals

3

TABLE 106

ESTIMATES OF UNDISCOVERED RECOVERABLE RESOURCES, PRODUCTION PROFILES AND FACILITIES REQUIRED1/

Estimates for Between 200 and 2500 Meter Depth are Enclosed in Parentheses.2/

OCS AREA	Undiscovered Recoverable Resources Oil3/ (billion bbls.)		Gas (trillion cu. ft.)		Years of Production		Years from Sale to Peak Production		Average Annual Production Oil (million bbls.)		Gas (billion cu. ft.)		Number of Platforms		Number of Pipelines		Number of Onshore Terminals		Number of Offshore Terminals	
	SM	5%	SM	5%	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E
	4/	5/	4/	5/																
No. Atlantic	0.9	2.5	4.4	13.1	20	35	10	18	45	70	220	375	20	40	2	6	2	4		
Mid. Atlantic	1.8	4.6	5.3	14.2	25	35	10	18	70	130	210	410	25	60	3	9	2	6		
So. Atlantic	0.3	1.3	0.7	2.5	15	30	10	16	20	40	45	85	5	20	2	4	1	4		
MAFLA	1.0	2.7	1.0	2.8	20	35	8	18	50	75	50	80	10	30	2	5	1	4		
	(0.5	1.3)	(0.3	1.2)	(20	30)	(12	18)	(25	45)	(15	40)	(4	10)	(2	5)	(1	2)	(1	3)
Central Gulf of Mexico, South Texas 6/	3.8	6.4	49.0	93.0	30	40	15	20	125	160	1600	2300	70	110	11	19	6	12		
	(0.9	1.9)	(8.7	19.3)	(25	35)	(12	20)	(35	55)	(350	550)	(9	20)	(4	9)	(2	3)	(3	6)
So. California	1.1	2.1	1.1	2.1	25	35	10	18	45	60	45	60	15	25	3	7	2	5		
	(1.2	2.9)	(1.2	2.9)	(25	35)	(12	18)	(50	80)	(50	85)	(4	10)	(3	7)	(1	2)	(2	5)
Santa Barbara	1.5	3.0	1.7	3.3	25	35	10	18	60	85	70	95	20	30	3	7	2	5		
	(0.9	2.1)	(1.1	2.3)	(25	35)	(12	18)	(35	60)	(45	65)	(4	10)	(2	5)	(1	1)	(1	4)
No. California	0.4	0.8	0.4	0.8	15	30	6	16	25	30	25	30	5	10	2	3	1	3		
Washington-Oregon	0.2	0.7	0.3	1.7	15	30	8	16	10	25	20	55	3	10	2	3	1	3		
Cook Inlet	1.2	2.4	2.4	4.5	25	35	10	18	50	70	95	130	15	30	3	5	2	4		
Gulf of Alaska 7/	1.5	4.7	5.6	14.0	25	35	12	18	60	135	230	400	20	60	4	10	3	8		
Aleutian Shelf	0.1	0.2	0.1	0.5	15	25	12	20	6	8	5	20	2	5	2	2	1	2		
Bristol Basin	0.7	2.4	1.6	5.3	20	35	12	20	35	70	80	150	15	50	3	7	2	7		
Bering Sea	2.2	7.0	5.7	15.0	25	40	12	20	90	175	230	375	30	90	4	12	4	12		
Chukchi Sea	6.4	14.5	19.8	38.8	30	40	15	20	210	360	650	1000	80	160	10	22	10	22		
Beaufort Sea	3.3	7.6	8.8	19.3	30	40	15	20	110	190	290	480	40	90	5	12	5	12		
Totals	29.9	8/	119.4	8/	-	-	-	-	1156	9/	4325	9/	396	9/	72	9/	50	9/	7	9/

1/ Estimates of undiscovered recoverable resources are given at two levels. The statistical mean (SM) resource estimates have been used to forecast moderate levels (M) of peak production and facility requirements. The 5% probability resource estimates have been used to forecast extreme (E) production profiles and facility requirements. Forecasts of production profiles and required facilities assume:

- facilities estimates are based on peak production which is 1.25-2.00 times the average production
- economic factors will warrant development and production of the resources discovered
- an oil well for each 500 bopd and a gas well for each 10 mmcfgpd.
- 20 wells per platform
- an oil pipeline for each 70,000 bopd and a gas pipeline for each 700 mmcfgpd.
- offshore terminals for the deeper waters
- platform development for the Far North.

2/ Estimates limited to areas where development is underway or leasing is planned in the near future.

3/ Natural gas liquids not included. Undiscovered recoverable natural gas liquids for the U. S. Continental Shelf areas to 200 meters water depth are calculated to be 2.8 billion bbls., based upon the statistical mean estimates of undiscovered recoverable natural gas and an appropriate gas/oil ratio. Information is inadequate to warrant estimates for individual areas.

4/ The statistical mean (SM) resource estimates are calculated by adding a low value estimate (95% probability), a high value estimate (5% probability) and the modal value and dividing the sum by 3.

5/ 1 in 20 chance that more than the amount estimated is present.

6/ Estimates for these two areas combined.

7/ Includes Kodiak Tertiary Province.

8/ It is statistically incorrect to sum the 5% probability estimates for individual areas to obtain regional or U. S. totals. Estimates of the undiscovered recoverable resources for the U. S. Continental Shelf areas to water depths of 200 meters are 49 billion barrels of crude oil and 181 trillion cubic feet of natural gas at the 5% probability level.

9/ It is statistically incorrect to sum forecasts of oil and gas production and required facilities that are based on 5% probability level estimates of hydrocarbon resources. Forecasts based on statistical mean hydrocarbon resource estimates may be summed, however.

General:

- The methodology used in estimating undiscovered recoverable oil and gas resources is contained in USGS Circular 725, "Geological Estimates of the Undiscovered Recoverable Oil and Gas Resources in the United States." Free copies are available upon request to the U. S. Geological Survey, Branch of Distribution, 1200 South Eads Street, Arlington, Virginia 22202.
- While the effort to produce the information in Table 106 is the most rigorous undertaken to date, it is anticipated that the estimates will change as additional studies are completed.
- As exploratory and development drilling for oil and gas continues in offshore areas under development and commences in the frontier areas, recoverable resources which are discovered will be classified as either measured or inferred reserves.

anticipated environmental impacts in any area or for the total proposal amounts to a substantial over statement of the anticipated OCS development activities envisioned in the proposed lease schedule.

Identification of the expected environmental impacts of this large and complex proposal is a difficult taks. The method used in this chapter is analytical and is divided into the following eight steps.

1. The effluents of OCS oil and gas production which have the capacity to produce environmental impacts are identified and quantified by their source of orgin. This quantification is done using historical data, which may be a poor indicator of future OCS pollution, but is nevertheless useful if treated with caution.

2. The hazards to OCS oil and gas operations caused by natural environmental conditions, e.g. winds, earthquakes, etc. in each area are examined. This provides impact-generating effluents.

3. The proximity of hypothetical drilling sites in all OCS areas to significant coastal features is then portrayed.

4. The significance of large oil spills in the marine environment is discussed. This is done by first describing the movement and weathering of a large hypothetical oil spill. Then a case history of the Santa Barbara oil spill is presented to better identify the environmental consequences of a large oil spill.

5. The generic impacts of all aspects of oil and gas operations are then discussed. This subsection focuses on the ways that organisms, communities, habitats, social and economic conditions could be affected by development in all OCS areas. This is a descriptive, non-quantitative subsection.

6. Impacts that are not unique to any given OCS area, i.e. those which are expected to occur either (1) everywhere development takes place in roughly the same degree, or (2) somewhere, but in no specific locale that can be identified at this time, e.g., impacts on archeological sites, are then identified.

7. Significant resources for all OCS areas are then identified in tabular format. These resources are summarized from the Fish and Wildlife Service material presented in Section II. These resources are presented here in an area-by-area fashion for comparison with the analysis that follows concerning the risk of development in each of the OCS areas.

8. The impact risk analysis is the backbone of the analytical differentiation of the various OCS regions. This analysis utilizes the 3 components previously discussed. (1) estimates of potential oil spillage based on anticipated intensity of development and transportation modes; (2) proximity (temporal and spatial) of hypothetical production areas within each OCS area to coastal features; and (3) the natural hazards to OCS development in each of the OCS areas that are different from, or more or less severe than, those experienced at the present time by OCS operations in the Gulf of Mexico and Southern California. When combined, these components form a summary matrix of the environmental risks of development in each OCS area based on oil spillage potential and the possibilities of impacting coastal features.

This procedure allows identification of the expected environmental consequences of the proposal to accelerate OCS oil and gas leasing. It also depicts in general terms the relative differences in anticipated environmental impacts for each of the 17 OCS areas. The rest of this introductory section explains each of these eight steps. However this methodology does not identify the potential for cumulative impacts, i.e. impacts different in magnitude than the sum of the impacts in each area impacted. Additionally this methodology does not identify the potential impacts on endangered wildlife. Both of these difficult and very speculative topics are discussed in separate sections which follow the summary matrix of environmental risks of development in each area.

In light of existing operation practices, regulations, economics, and technology, some impacts of OCS oil and gas development are the result of routine operations. Accidents caused by human error, equipment failure, or severe operating conditions can also generate impact-producing effluents. This two-fold classification of impact-generating effluents and events provides a convenient means of discussion the wide variety of impacts which result from OCS oil and gas development. Each impact-producing operation and event will be discussed, and where it is possible, the magnitude or duration of expected impacts associated with that operation will be identified.

The environmental impacts caused by a large oil spill are often difficult to gauge. To help clarify the way large oil spills damage the marine environment, the movement and weathering of a hypothetical oil spill is described in some detail. A case history of the Santa Barbara oil spill is then presented to provide a well-documented example of the environmental consequences of a large OCS oil spill.

The discussion of generic impacts addresses the range of environmental impacts that can result from the potential effluents, operations or induced industrialization of OCS development. It adopts a generalized approach to the kinds of things that can happen to organisms, the kinds of things that can happen to habitats, the kinds of things that can happen to recreation resources, air and water quality, ports and shipping, and the kinds of things that can happen to socio-economic conditions. This discussion takes no predictive quantifying stance, and does not address each OCS area except insofar as a particular area has a unique feature (e.g. kelp beds in Southern California) that could sustain impacts from one or more aspects of operations. The section is thus a general discussion of known or anticipated impacts from all aspects of operations on environmental and social components.

Many impacts will take place to roughly the same degree no matter which area is being developed, and are thus undifferentiable among areas except for the species of biota being affected. Examples would include the impacts of phytoplankton or zooplankton, which we are presuming would be generally the same in all areas (possibly more significant in colder climates). Additionally, some impacts will occur on things which are not yet aware of, or may never be aware of, e.g., archeological resources.

A summary of the Fish and Wildlife Service material from Section II on significant resources region-by-region for comparison with the region-by-region risk analysis which follows. Resource comparisons on the bases of value and vulnerability were deemed violation of scientific objectivity and thus are not included. The attempt at comparing resources within categories (e.g., birds of the South Atlantic versus birds of Southern California) and across categories (e.g., the birds of the South Atlantic versus the marine mammals of the Gulf of Alaska) produced no criteria that could be used in a valid analytical manner to make such comparisons. In most cases, such comparisons are subjective and change dramatically with the perspective and background of the observer. What is more important is that the possible impacts on these resources be discussed, and that the risks of development and thus causing of impacts be analyzed region-to-region.

To quantify area-specific impacts, the following questions must be asked:

When will development take place?

Where will development be located, for example, geographical region, water depth, and distance from shore?

What will the rate of development be?

What specific technologies will be employed for example, surface floating storage, or underwater completions?

What economic, administrative, and regulatory policies will be used?

In general, available knowledge is not adequate to identify all of these variables. This lack of a sufficient information base can be at least partially overcome by postulating hypothetical or likely drilling sites within each area and estimating possible field sizes and production levels. With this information it is possible to use historical spill rates and probabilities to project expected volume and number of accidental oil spills. The impacts generated from drilling wells can also be identified using hypothetical drilling schedules for each area. Similarly, the likely tradeoffs between pipeline and tanker or barge transportation of the petroleum from the OCS areas to shore or from the region can be identified.

An impact risk analysis across regions is then performed on these data. This entails three separate and distinct analyses; the components are oil spillage potential, natural hazard assessment, and proximity to coastal features.

Oil spillage potential is first estimated. This is done using U.S. Geological Survey estimates of the oil and gas production potential for each OCS area, as presented in Section I. These likely production estimates are multiplied by the historically observed spill rates for each phase in the OCS oil and gas development system to obtain estimates of the expected volume of effluents for each area. The possible mode of transportation also enters the calculation. USGS also provided characterizations of the anticpated modes that would transport oil from each area; where tankers could possibly be used extensively, estimates of potential oil spillage were factored upward to reflect the higher spill rate from tankers as opposed to pipelines.

The diversity of natural environmental conditions in the various OCS areas provides another means of assessing the relative environmental risks confronted in each area. This is done by noting the differences between the various areas in terms of severe storms, ice, earthquakes, and tsunamis. Each of these natural phenomena has the potential, either alone or in combination, to cause oil spills. Tetra Tech Inc. performed an analysis of the effect of natural phenomena on OCS petroleum development for the Council on Environmental Quality (CEQ, 1974). The results of this study are summarized in this Section. Additionally, the Department of the Interior has extended this assessment of the environmental risks of natural phenomena to the OCS areas not included in the CEQ report. This analysis presents the relative risk of natural phenomena for each element in the OCS petroleum production system. The magnitude of potential spills from each element in the OCS oil and gas production are also identified but the expected volume of OCS spills is not identified using this approach.

Another important variable in assessing the relative severity of OCS petroleum development impacts is the proximity of the drilling sites to important oceanic and coastal zone resources. The environmental impacts of large oil spills on shore areas are generally perceived to be the most significant environmental hazard of OCS petroleum development. The Council on Environmental Quality in their OCS Oil and Gas - An Environmental

Assessment made extensive use of oil spill movement from hypothetical OCS drilling sites to shore. To perform an evaluation of the importance of the proximity of OCS petroleum development to important coastal resources, hypothetical drilling sites were identified by the U. S. Geological Survey for each OCS area. For the areas discussed in the CEQ report, the estimates of the probability that an oil spill will reach the shore were used to identify the proximity aspect of the relative environmental risk of petroleum development. For the areas that CEQ did not evaluate, the proximity evaluation is less quantitative. The physical proximity of the drilling sites to other uses is discussed. When knowledge of current and wind regimes is sufficient to allow identification of the likely direction and speed at which a spill would move, this information is used to modify the proximity evaluation.

The separate components of the impact risk analysis are then combined to produce a summary table. The methodology used is explained with the table; briefly, it begins with the oil spillage potentials and modifies them on the basis of how much more hazardous operations would be than similar operations in the

Gulf of Mexico, and on the basis of proximity to coastal features. The CEQ evaluation of the relative environmental risk is presented as one of the columns in this table.

Because of the diversity of the types of impacts in the various areas, no attempt has been made to rank the relative environmental risk involved in each area. To produce such a ranking would require assignment of relative importance factors to each of the diverse types of environmental impacts. Whether potential impacts on birds should be viewed as more important than potential impacts on recreational swimming beaches was deemed to be beyond a reasonable scope for this analysis. The results of the impact risk analysis are used to construct alternative lease sequence scenarios in Section VIII on Alternatives. In order to do this, biotic and other resources are considered to be, in general, equally important in all areas. Individual resources, e.g., shrimp in the Gulf of Mexico, may be more important in one area than another, but each region generally includes one or more significant resources that addes to that region's cumulative resource value. It is this cumulative resource value that is considered to be equal for all regions.

B. The Sources of Impact Generating Effluents

1. General Environmental Impacts of OCS Petroleum Development Operations

The OCS oil and gas development activities envisioned in the proposal could eventually result in a variety of impacts on the natural environment, on air and water quality, on land use patterns, on the aesthetic quality of the coastal zone, on the social order and on the economies of each of the 17 OCS areas. Even though the accelerated leasing proposal is not in itself a proposal to actually develop the petroleum resources of any of the 17 OCS areas, this section describes how the routine operations and occasional accidents attendant to OCS oil and gas development generate effluents which can cause adverse environmental impacts. Prior to leasing in each area, these effluents and the environmental impacts they generate will be evaluated in site specific environmental impact statements. The intent of this section is to identify the types and volumes of effluents generated by routine operations and accidents. This is done for each of the effluents produced in day-to-day operations as well as each type of accident. Wherever possible the expected volume of effluents is identified in a way that will allow estimates of the total volume of effluents for each area and the aggregate for all areas. When it is not possible to identify the expected volumes of effluents, the reasons are stated.

2. Impacts Generated by Routine OCS Oil and Gas Production Activities Which are Economically Unavoidable Under Existing Technology and Regulatory Practices

a. Discharge of Cleaned Drilling Muds and Drill Cuttings

As the drill bit bores through the bottom sediments and the underlying native rock, it shatters and pulverizes these materials and they move up the riser to the surface where they are cleaned and discharged overboard. Mixed with the drill cuttings as they are discharged overboard is a considerable volume of commercial drilling muds, although much of the drilling mud is retained for re-use. Drill cuttings are not known to be toxic, and their discharge overboard should cause only minor environmental impacts. However, certain components of drilling muds are known to be toxic to certain fresh water organisms. The impacts caused by discharging the drilling muds are poorly understood. The drilling mud components of a representative well drilling program are identified in Table 107. Most of discharged drill cuttings and drilling muds should either settle to the bottom within a small area around the drilling platform or disperse as a plume of turbidity, and the area affected by these discharges should be small.

The volume of drill cuttings and drilling muds discharged, of course, increases as the depth of the wells drilled increases. At this time the number and depths of the petroleum deposits in the various OCS areas are unknown and therefore, it is not possible to estimate the total volume of these discharges which might be generated under the proposal.

Table 10.7 COMPONENTS OF DRILLING MUDS WHICH ARE NORMALLY DISCHARGED INTO THE SEA

Substance	Source	Use	Composition	Known Hazard
Attapulgite clay	Quarry	To cause gelling of salt water based muds	A light green magnesium-rich clay, quarried as "Fullers Earth"	NONE
Bentonite Clay	Quarry	To cause gelling of freshwater based muds	A light-colored montmorillonitic clay; slippery sticky when wet; swells to 10-20 times its dry volume	NONE
Caustic soda	Electrolysis of sodium chloride brine	For pH control	Sodium hydroxide, $NaOH$	Corrosive in concentrated form; not harmful after mixing into mud at low concentration and allowed to react
Ferrochrome lignosulfonate	Digestion of wood by sulfonate process; removal of cellulose; reaction with chromium compounds	Dispersant and emulsifier	Ferrochrome salt of lignosulfonic acid; content: Fe-2.6%, Cr-3.0%, S-5.5%	Possible chromium toxicity in pure form, none known from diluted form in muds
Organic polymer	Chemical process with plant starch, wood fiber as raw materials	Conditioner, texturizer	Starch, cellulosic derivatives	NONE
Proprietary defoamer	Soap making process	Defoamer	Aluminum stearate $Al[Ch_3(CH_2)_{16}]_3$	NONE

b. Discharge of Produced Formation Waters

Petroleum reservoirs often have water associated with the oil and gas and this water is called formation water or oil field brines. Some petroleum reservoirs contain substantial amounts of formation water, whereas other contain almost none. Typically, petroleum reservoirs which have water drive produce very large volumes of formation water while gas drive reservoirs produce little formation water. Before wells are drilled into a petroleum reservoir, the amount of formation water associated with the petroleum deposits is not known. Therefore, at this time it is not possible to estimate the amount of formation water production which may be associated with petroleum production from the petroleum deposits of the various undeveloped regions of the OCS. While substantial amounts of formation water will likely be discharged into the sea, a significant portion of the formation water will also be reinjected into subsurface formations either to enhance recovery of the petroleum products or, less frequently, to reduce adverse environmental impacts.

Adverse environmental impacts generated by discharge of formation waters are caused by the physical properties of the formation water and the unremoved petroleum hydrocarbons. Current operating regulations require that the hydrocarbon concentrations of any single discharge of formation waters not exceed 100 ppm and furthermore, that the average hydrocarbon content of the aggregate of discharged formation waters not exceed 50 ppm. These standards are not based on scientific studies of the impacts caused by this continuous discharge of petroleum hydrocarbons. Presently the Environmental Protection Agency is investigating the desirability and feasibility of changing these discharge standards.

The mineral content of formation waters can also generate adverse environmental impacts. At this time, the mineral content of the formation waters associated with the undeveloped petroleum reservoirs in the various OCS areas is not known. Some fields in Texas produce almost pure water whereas the average total dissolved solids of 76 samples from southern Louisiana and the OCS was found to be 112,513 milligrams per liter (mg/l) with a range from 270,400 mg/l to 61,552 mg/l. Oil field brines commonly contain varying amounts of iron, calcium, sodium, bicarbonates, sulphate, and chloride ions. Ocean waters around the world also contain each of these ions in varying amounts.

The impact-generating potential of discharged formation waters is that the concentrations of these ions in the formation water differ from the concentrations of these ions in the surrounding waters. Discharged formation waters with higher than ambient ion concentrations will sink because they are heavier. Discharged formation waters with dissolved solid concentrations lower than the receiving ocean water will tend to float on top of the receiving water. In either case, the discharged formation waters will mix with the surrounding waters, and their mineral content after some time will become indistinguishable from that of the receiving water. Water currents in the discharge area will speed this mixing process. Continuous discharge of formation waters from OCS production will, therefore, alter the dissolved solids characteristics of the waters adjacent to these discharges. The size of the area affected will, of course, depend upon the volume of formation water discharged, the dissolved solids content of the formation waters, and the dissolved solids content of the receiving waters.

Another characteristic of formation waters which has a capacity for generating adverse environmental impacts is that formation waters are typically void of oxygen. Just as the unusual mineral content of formation waters can cause physiological problems for the living marine organisms in the area of the discharge, so can the lack of oxygen in these waters. However, the size of this impact will be small. As the formation waters mix with the surrounding waters, the oxygen content of the formation waters will become indistinguishable from the surrounding waters.

Not knowing either the expected volume of formation waters or their mineral content precludes quantification of the environmental impacts associated with discharge of these fluids. However, knowledge of the impact-generating potential of discharged formation waters, discussed above, indicates that the magnitude or severity of these impacts should not be large. Each site-specific environmental impact statement will attempt, where well data permit, to quantify the impacts associated with discharge of formation waters. If studies of the impacts generated by either the hydrocarbon content or mineral content of formation waters indicate that unacceptable environmental impacts are created by discharging formation waters, appropriate mitigating measures will be adopted.

c. Disruption of Sea Floor and Resuspension of Sediments During Pipeline Burial

Present OCS operating regulations require burial of pipeline in water depths of less than 200 feet. Present requirements for granting pipeline rights-of-way permits by BLM stipulate that these pipelines be buried to a depth of 3 feet into the sediments where the overlying water depth is 200 feet or less. Gathering lines from clustered rigs or proximate fields do not have to meet this requirement, as they are considered part of the production system. They are generally not buried, as commercial ship traffic is at a minimum close to rigs. Because they are small diameter lines, gathering lines tend to sink into the sediments by themselves. During pipeline burial, a large volume of bottom sediments are disrupted and resuspended for a short time in the overlying waters. The dimensions of pipeline burial excavations vary considerably depending upon the nature of the bottom sediments. This makes it difficult to calculate a reasonably accurate volume for the materials disrupted. At some future date, when exact pipeline routes are drawn for each OCS area, the volume of disrupted bottom sediments can be calculated with some accuracy. The establishment of pipeline corridors is discussed in Section IV of this statement.

In general, the environmental impacts of pipeline burial are very similar to those of discharges of drill cuttings and drilling muds

1) Dredging in nearshore areas will often result in resuspension of many years accumulation of such materials as organic matter, phosphates, and other nutrients, as well as toxic heavy metals and pesticides. The heavy metals and pesticides are of particular concern because resuspension of these materials will allow them to exert their toxic effects until they are gradually reincorporated into the sediments. The disruption of the organic matter and nutrients will increase the biochemical oxygen demand (BOD) and could lead to localized problems of insufficient dissolved oxygen to support life. The potential impacts associated with increased BOD should be of short duration.

2) On hard bottoms, dredging will eliminate suitable sites for attachment of the biotic communities dependent upon hard substrate attachment (sponges, soft and hard corals, seaweeds, sessile molluscs). This impact will persist throughout the pipeline burial path either permanently or until the substrate gradually becomes compacted.

3) Both pipeline burial and discharge of drill cuttings and drilling muds can smother the burrowing and attached benthos. This can occur where these materials settle to the bottom and accumulate to significant depths.

4) Pipeline burial, like discharges of drilling muds and drill cuttings, increases turbidity in all locations where these activities occur. The small sized particles causing this turbidity can clog the respiratory organs of many marine organisms and the filter-feeding mechanisms of numerous others.

5) In coastal wetlands and uplands, pipeline burial operations will displace many species of wildlife during construction and maintenance operations. The effects of pipeline burial in wetlands can have a substantial impact of one to several

years duration as a result of devegetation and disruption of substrate. An additional significant impact of pipeline burial in coastal estuaries can result from disruption of the water circulation patterns.

d. The Physical Presence of Platforms, Boats, Barges and Ancillary Onshore Facilities

The construction and placement of OCS petroleum drilling and production platforms will cause significant environmental impacts. The physical presence of platforms on the OCS will affect both commercial fishing and navigation. Petroleum production platforms on the OCS adversely affect commercial fishing by: (1) removing open waters and seafloor from use by purse seiners and trawlers, and (2) creating obstructions on the seafloor upon which both purse seiners and trawl nets can foul. The flotsam and jetsam from OCS petroleum operations can also generate adverse impacts on commercial fishing similar to those caused by platforms.

Both platforms and the flotsam and jetsam attendant to OCS petroleum operations can also cause adverse aesthetic impacts. In certain OCS areas such as southern California, the unsightliness of offshore platforms is a major concern. Platforms erected on tracts visible from shore on clear days could reduce the scenic values of some very valuable real estate. Furthermore, these same platforms may be objectionable to recreational users of public beaches and other coastal zone recreational activities. Requiring subsea completions in such areas is one way of removing this adverse impact on the aesthetic values of the coastal zone.

Nearshore OCS petroleum structures can also be camouflaged by placing mirrors on the coastal side of the structures. If this is done, the platform would not be visible to coastal viewers. Alternatively, nearshore petroleum development structures can be made less offensive or even attractive by erection of facades. In the Los Angeles area, one onshore petroleum structure has been disguised as a high rise building. Similarly, offshore structures can be made to look like islands, lighthouses, etc.

Petroleum development platforms can also interfere with coastal shipping traffic. Further, OCS oil and gas development will increase ship traffic in all OCS areas. This increase in ship traffic will be more pronounced if tankers and barges are used to transport the petroleum products either to adjacent coastal areas or to distant areas. Both the increase in ship traffic and the platforms attendant to OCS petroleum production will increase the possibility of collisions between ships and between ships and platforms. Conflicts between platforms and coastal shipping can be mitigated by not allowing platform placement in established coastal shipping lanes. A considerable proportion of oil and gas resources under shipping lanes can be extracted by directional drilling from platforms adjacent to these lanes.

Construction of onshore facilities necessary to support and process OCS petroleum production will cause additional adverse environmental impacts. These impacts are discussed at length later in this chapter.

3. Impacts Resulting from Accidents

The information discussed in this section was taken from previous OCS EIS analyses as well as numerous sections of the Council on Environmental Quality's OCS Oil and Gas - An Environmental Assessment, Report to the President (1974).

In any complex industrial operation involving heavy equipment, flammable materials, work at sea, large number of employees, and reliance on complex technology, it is inevitable that accidents will occur. Proper analysis of these accidents is a complex problem. The history of OCS petroleum development accidents provides a substantial data base for estimating the frequencies of future accidents. The Council on Environmental Quality contracted with ECO, Inc. and with the Massachusetts Institute of Technology to analyze the probability of offshore oil spills. Statistical analysis of oil spills is difficult because of the following characteristics of oil spills.

- The size range of individual spills is extremely large, from a fraction of a barrel to over 150,000 barrels.

- Most oil spills are small; in 1972, 96 percent were less than 24 barrels (1,000 gallons) and 85 percent was less than 2.4 barrels (100 gallons).

- A few very large spills account for most of the oil spilled, e.g. in 1970 and 1972, three spills each year accounted for two-thirds of all oil spilled in the United States in those years.

These facts are highlighted to point out that estimates of the average amount spilled are almost meaningless. The amount spilled from any source can vary by a factor of 1 million, and single spills like the Santa Barbara spill can distort the size distribution of spill magnitudes. Further, as shown in Table 108, annual fluctuation in spill volumes are quite large. There are at least two different ways of using oil spill statistics to assess the probable number and magnitude of oil spills which could result from the proposed acceleration of OCS petroleum leasing. First, the historical spill rates for each type of accident are described. This is the procedure followed in the majority of site-specific OCS EIS's. Then the probabilities of oil spills will then be discussed using the analysis done by the Massachusetts Institute of Technology for CEQ.

a. Natural Gas Leaks Associated with Blowouts

Information furnished by the Geological Survey for the period 1956 to 1973 lists 38 gas leaks associated with well

TABLE 108

OIL SPILL STATISTICS
(Barrels)

Type of Spill	1971	1972
Petroleum Industry-related Spill		
Terminals		
Number	1,475	1,632
Volume	125,800	54,700
Ships (offshore)		
Number	22	32
Volume	400	51,600
Offshore Production Facilities		
Number	2,452	2,252
Volume	15,600	5,700
Onshore Pipeline		
Number	74	162
Volume	8,700	29,300
Total		
Number	4,023	4,078
Volume	150,500	141,300
All Spills		
Number	7,461	8,287
Volume	205,000	518,000

Source: The Massachusetts Institute of Technology Department of Ocean Engineering, 1974. "Analysis of Oil Spill Statistics," prepared for the Council on Environmental Quality using U.S. Coast Guard data. (OCS Oil & Gas - An Environmental Assessment, Report to the President, CEQ, 1974).

blowouts during OCS petroleum development operations in the Gulf of Mexico. No gas leaks have been reported from the California OCS. Eleven of these incidents in the Gulf of Mexico involved fires and five were associated with oil or condensate spills. The duration of these blowouts ranged from two hours to over seven months. No estimates of the amount of gas lost have been made. Degradation of air quality is the primary environmental impact of gas leaks with or without fires. Several gas leak incidents also resulted in injury and death of members of the OCS platform crew, and damage or loss of valuable equipment.

b. Oil Spills Greater than 50 Barrels in Size

Data supplied by the Geological Survey for the period 1964-1974 (includes only first quarter of 1974), list 45 oil spill incidents of 50 barrels or more of oil and condensate resulting from Federal OCS oil and gas operations. Most occurred in the Gulf of Mexico. Only one of these incidents occurred in the California OCS operations--the blowout on Platform A in the Santa Barbara Channel. A detailed discussion of the Santa Barbara incident is presented in section III.D.2.

The estimated total volume of oil and condensate spilled during this 1964-1974 period is slightly more than 300,000 bbl. (12.6 million gallons). A distribution of the 44 Gulf of Mexico incidents as to type of accident and amount spilled is presented in Figure 83 . The total production of oil and condensate from Federal OCS operations during the 1964-1974 period was approximately 2.9 billion barrels. Thus, the volume spilled compared with the volume produced results in an overall throughput spill rate of approximately .01035 percent. In the following discussion of oil spills by type of accident, this history of 45 OCS accidents will be used to provide an estimate of the expected throughput spill rates for each type of accident.

(1) Pipeline Accidents

During OCS operations, more oil has been spilled from pipeline accidents than from all other types of OCS petroleum production accidents. The largest OCS oil spilled occurred in October, 1967 when a vessel underway during a storm dragged its anchor, which was inadvertently left out, across a pipeline. The snagged pipeline severed and the resulting spill went undetected for nearly two weeks, releasing over 160,000 barrels of oil into the ocean about 20 miles west of the mouth of Southwest Pass, Mississippi River Delta, Louisiana. In March of 1968, another anchor dragging incident resulted in a 6,000 barrel spill. In February of 1969, a pipeline leak of undetermined cause released over 6,500 barrels into the sea.

Starting in 1969, several actions were undertaken to reduce the chances of such accidents and to reduce the volume of these spills. Burial of all new common carrier pipelines with a minimum cover of

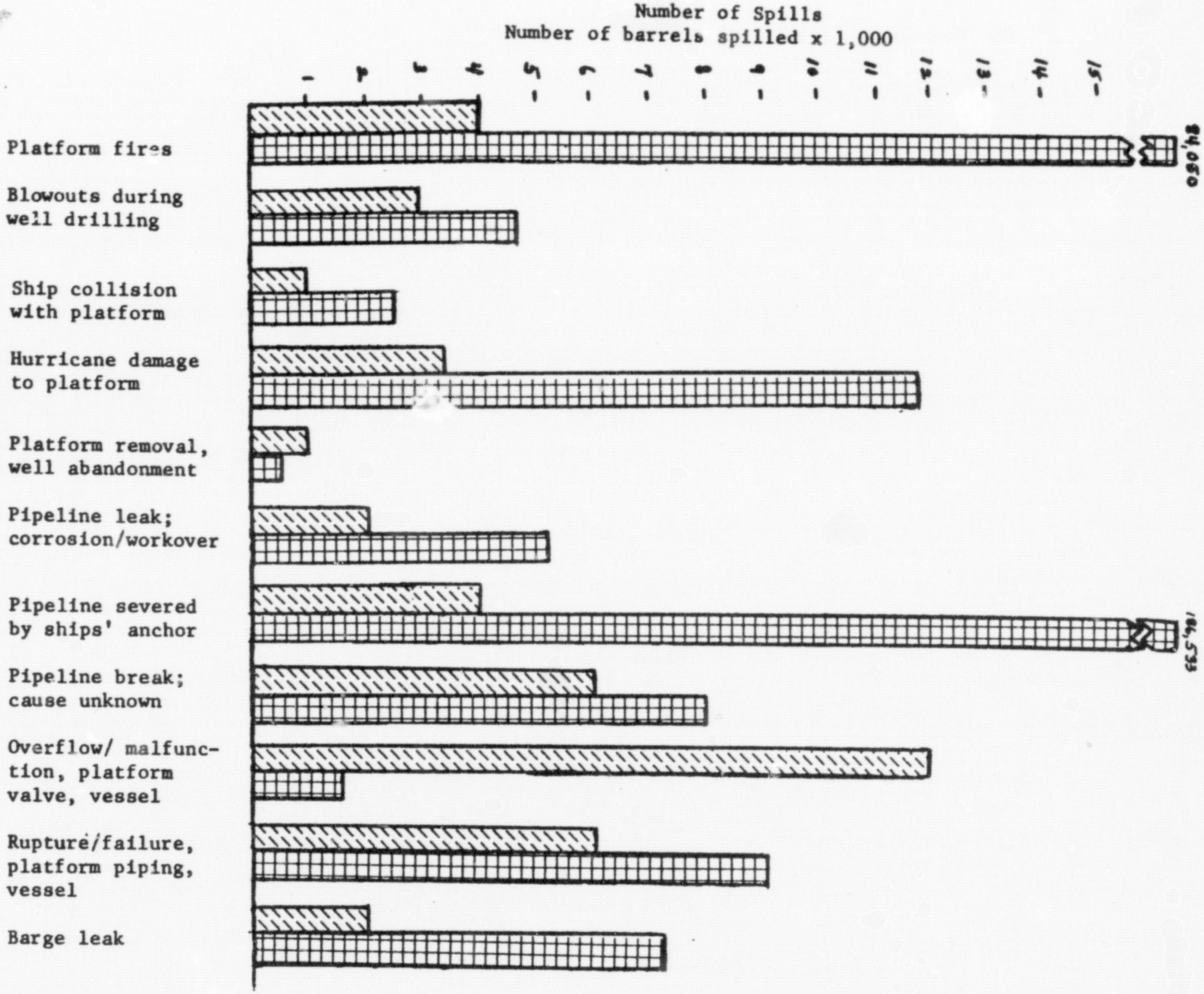

Figure 83. Oil Spills ≥ 50 bbl. Number and Amount (Data from Geological Survey.)

three feet (10 feet in shipping fairways and anchorage areas) was required by BLM for right-of-way permits in water depths of less than 200 feet. The water depth requirement for pipeline burial may be increased to 250 feet for the Southern California OCS sale. In water depths of less than 200 feet, only the lines in the gathering system between adjacent platforms of a particular oil or gas field may remain unburied. Permits to construct these gathering lines are granted by the Geological Survey and the decision on whether to require burial is made on a case-by-case basis. These administrative actions have substantially reduced the risks of future pipeline ruptures due to anchor dragging.

Additional safeguarding of OCS pipelines and mitigation of accidental spills is provided by regulations promulgated by the Office of Pipeline Safety (OPS), of the Department of Transportation. Petroleum pipelines in offshore areas are required to be coated with tightly banded materials impervious to moisture, followed in many cases by a layer of dense concrete for mechanical and corrosion protection (49 CFR Parts 192 and 195). To protect against electrolytic corrosion, impressed currents of sacrificial anodes are required. Regulations by OPS also mandate use of a continuous line pressure monitoring with some type of built-in alarm or automatic shut-down system. The OPS regulations requiring protection devices and pressure monitoring systems, coupled with regular inspection of the pipeline route for leaks and other irregularities, should also substantially reduce the risk of pipeline oil spills.

Other features used by industry serve to further mitigate against accidents: continuous metering systems, automatic high pressure shut-downs, and remotely controlled mainline block valves that can isolate sections of the line. The latest pipe-laying and monitoring techniques, combined with modern materials and equipment, will further help to insure that the pipelines used in the various OCS areas will function at an acceptably high level of reliability.

Prior to institution of the new pipeline burial requirements, the spillage rate from pipeline accidents was .00624 percent of total production. With the new regulations, this spillage rate has been substantially reduced to .0017 percent of total production in the period since 1970. Although the new regulations and improved industry practices have brought the spillage rate down, the problem of pipeline spills from anchor dragging has not been completely removed. As a part of the pipeline management program, the costs and benefits of extending pipeline burial systems will be investigated.

Caution should be inserted at this point. The improved performance of pipelines now in existence may not continue. Industry spokesmen have estimated that 48 percent of all pipeline leaks occur in lines that have been in use for 15 years or more. In established offshore petroleum fields where older pipelines are present, corrosion may be in an advanced state. Such pipelines may be poorly buried, if at all, and all of the above mentioned safety and control features may not apply. If serious spillage should occur from some of these older pipelines, the statistical improvement in pipeline performance could be reversed. However, in each future OCS lease sale, all of the safety and control requirements discussed above will be enforced. Therefore, it may be expected that these pipelines should function adequately, since they will be new lines.

(2) Oil and/or Gas Well Blowouts During Drilling

Data from the Geological Survey lists a total of 44 blowouts in Federal OCS petroleum operations during the 1964-1974 period. Only 17 of these blowouts resulted in oil spills of 50 barrels or more. The total amount of oil and condensate spilled was approximately 73,000 barrels. Examination of OCS statistics indicate one blowout per 2,860 wells drilled (or .035 percent of wells drilled blew out), spilling an average of 2,100 barrels of oil and condensate per blowout.

The Santa Barbara oil spill provides an example of a blowout during drilling.

Santa Barbara Spill

On January 29, 1969, a blowout occurred below Platform A about six miles southeast of Santa Barbara, California. Thousands of gallons of oil spewed into the Santa Barbara Channel, as men worked feverishly to regain well control. This blowout and spill occurred through a pre-existing fault in the ocean floor adjacent to the well. The apparent cause was accidental injection of high pressure gas from a deep reservoir into the shallow reservoir sands. Pressure built up in the shallow reservoir sands until the overlying rock layer ruptured. This rupture formed a fissure zone through which the oil moved up to the seabottom and escaped into the overlying waters (Reinhart, 1970). The blowout continued for 10 days, until the well was choked with cement on February 7, 1969. The reprieve was only momentary and spillage began anew a few days later. Some seepage continues to this day.

The Geological Survey estimated that the initial spillage from the Santa Barbara blowout totaled 420,000 gallons (10,000 barrels). Other estimates of the initial spillage range from 2,940,000 gallons to 29,400,000 gallons (70,000 to 700,000 barrels).1/ An additional seepage of 10,325 barrels occurred between February 7, 1969 and December 31, 1972. During 1973, this seepage continued at a rate of 1,825 barrels per year.

1/ Testimony of Dr. Carl H. Oppenheimer, OCS Public Hearing of August 23, 1972, New Orleans, Louisiana.

(3) Oil Spills Resulting From Explosions and Fires

Fires have always been a major hazard in the petroleum industry. OCS operations are no exception. Most fires are ignited by arcing electrical equipment and overheated mechanical devices. More rarely, lightning or static electricity is the cause of ignition. Sometimes, platform fires result from accidental ignition of stored fuel, solvents, or heat exchanger fluids. If caught soon enough, these small fires are usually controllable. If a storage tank or well catches on fire, the resulting inferno can cause major structural damage. Adjacent producing wells may have their piping severed and thereby contribute additional fuel to the fire. The majority of fires are quickly extinguished with little or no damage. Uncontrollable fires causing major structural damage usually involve numerous wells in the fire and all too often result in multiple fatalities.

The Geological Survey has reported 113 explosions and fires in the 1964-1974 period of Federal OCS activities. Most of these fires were extinguished before serious damage and pollution occurred. Only six of these accidents resulted in oil spills. However, the volume spilled in two of these incidents was very large, 30,500 barrels from one and 53,000 from the other. The total volume spilled from all explosions and fires is approximately 85,000 barrels. Perhaps of greater significance is the injury of 120 men and the death of an additional 59.

Due to the serious threat of injury and death, industry is typically very cautious about OCS explosions and fires. However, due to the history of fire-caused massive oil spills, OCS orders were amended to require extra safety precautions to reduce the potential for future fire related oil spills. To eliminate blowouts due to malfunctioning velocity-actuated downhole safety devices, OCS Order No. 5 requires surface actuated safety devices. If all wells are successfully closed during fires and explosions, the size of future fire-caused oil spills should be limited to the volume of flammables stored on the platforms when the fire started. Since 1971, explosion and fire accidents have not resulted in more than minimal oil spills.

(4) Oil Spills Caused by Severe Storms - Hurricanes

In the history of Federal OCS oil and gas activities, there has been only one severe storm which caused significant oil spillage. On October 3, 1964, a hurricane passed over the waters off central Louisiana destroying three OCS platforms. The total volume of oil spilled in this hurricane was approximately 12,000 barrels. All of this spilled oil was from tanks used to store produced oil prior to trans-shipment by barge.

Since 1964, three major hurricanes have hit the extensive offshore petroleum production areas off Louisiana. While causing financial damage to the offshore industry, they have not resulted in major pollution incidents from operations in Federal waters. When the Weather Service advises that a hurricane or serious tropical storm is imminent, all oil and gas facilities in or adjacent to the path of the storm are evacuated. Before evacuation, all surface equipment and wellhead controls are shut-in. In addition, blank tubing plugs are set in as many wells as possible to further reduce the possibility of pollution in the event the well is damaged.

The efficiency of these safety precautions was amply demonstrated during Hurricane Camille. On August 17, 1969, Camille passed along the eastern flank of the Mississippi Delta of Louisiana and into the Mississippi Gulf Coast. 1/ Camille's topwinds were estimated at 201.5 miles per hour and the storm surge raised sea level 22.6 feet above normal at Pass Christian, Mississippi. During Camille's onslaught, one production platform was destroyed and two were damaged, two drilling rigs were destroyed, and three were damaged. No significant oil spillage occurred.

The severity of storms occurring in the various OCS areas are substantially different from those encountered either in the Gulf of Mexico or off California. With only one incident on record, no generalization should be made concerning the maximum spillage which future severe storms may cause. The issue of storm-related hazards of operating in the various OCS areas is discussed in section III C.

1/ Corps of Engineers, Report on Hurricane Camille. Report No. 1338, 1970, U.S. Army Engineers District, New Orleans, Louisiana.

(5) Oil Spills Caused by Ships Colliding with Platforms

Commercial vessels can collide with OCS platforms, typically causing substantial damage to both the vessel and the platform. This section deals only with the oil spilled from platforms. The oil spilled from the vessels colliding with the platforms is dealt with in the next subsection. Accident records indicate only one instance of a significant oil spill from a platform caused by ship collision. In April, 1964, a freighter off central Louisiana struck and damaged a platform, resulting in a fire and loss of 2,560 barrels of oil into the sea. A history of one accident does not provide sufficient information to allow generalization about the magnitude or frequency of future collision related oil spills.

(6) Tanker and Tank Barge Accidents and Operations

Accidental oil spills from tankers and tank barges, as well as oil discharged during normal operations, are probably the largest sources of oil spills in the U.S. There are a wide variety of data sources for tanker accidents world-wide and estimates of tanker and tank barge spill rates vary widely. For example, the Bureau of Land Management has often used the 1971 data for world wide water-borne petroleum transports carried by the U.S. tanker fleet. This data indicates a spill rate of .08 percent of each cargo. Porricelli (1969) states that .03 percent of each cargo of U.S. tank barges is spilled into the marine environment each year as a result of mishaps and operations. Finally, the Massachusetts Institute of Technology, using a more complex data base, computed a ratio of the mean spill rate to the total volume of oil handled of .016 percent. This diversity of oil spill rates for tankers obviously makes it more difficult to state the expected spill rate associated with tanker and tank barge operations.

No matter which of the above estimates of tanker oil spill rates is used, the result is the same. Transportation of petroleum in tankers and tank barges is hazardous. In fact, all of the above tanker spill rates are higher than the total of all other OCS spill rates. This high oil spill hazard of tanker and tank barge transportation of petroleum is a very important factor in distinguishing the relative oil spill hazards of the various OCS areas. If the OCS petroleum production can be piped to shore, the oil spill hazard is substantially less than the oil spill hazard when tankers and barges are used. Further, if the oil and gas production of an area has to be transported by tankers out of that area for consumption in another area, once again the operation is exposed to the higher relative hazards of tanker transportation. An area by area assessment of the expected means of transporting OCS petroleum production for each area is presented in Section III.C.

It is difficult to assess the total amount of petroleum that will be spilled into the marine environment as a result of the daily operation of U.S. flag tankers and tank barges. Although there are estimates of the total amount of pollution resulting from cargo handling, tank barge leaks, and cleaning/bunkering/ballasting/bilge pumping, (Charter, et al., 1973 and Porricelli, et al., 1971) there is no breakdown according to registry. It should be noted, however, that U.S. Coast Guard regulations and standards are among the most stringent and rigidly enforced in the world.

Throughput spill rates are not the only available method for assessment of the oil spill hazards of tanker transportation of petroleum. The Massachusetts Institute of Technology performed an extensive analysis of oil spill statistics for the Council on Environmental Quality (Report No. MITSG 74-20, April 1974). Their analysis indicated that average spill rates were almost without meaning. Therefore, they concentrated their efforts on estimating the probability of spills larger than 1,000 barrels. Analysis of tanker spill statistics indicated that approximately 98 percent of all oil spilled from vessels is from incidents over 1,000 barrels. Most large tanker spills occur nearshore and are caused by groundings, rammings (the vessel hits a fixed structure), or collisions, Groundings and rammings occur nearshore and collision frequency depends on traffic density, which is highest nearshore.

M.I.T. expressed oil spill hazards as estimates of the probability of spills larger than 1,000 barrels. As the size of the petroleum field increases, so do the number of expected spills and the overall probability that a spill will occur. M.I.T. classified oil and gas discoveries as small finds. i.e. 500 million barrels of oil in place; medium finds, i.e. 2 billion barrels of oil in place; and large finds, i.e. 10 billion barrels in place. Using a complex worldwide data base of past tanker oil spills, M.I.T. estimated that the probability of one tanker spill over 1,000 barrels during the life of a small field was approximately 27 percent. During the life of a medium sized field, there is approximately an 85 percent probability of one such spill. For a large find, this probability is nearly 100 percent. M.I.T. also estimated the expected number of tanker spills over 1,000 barrels as well as the expected volume of spills over the life of each field size. The results were: small find 0.40 spills, 19,900 barrels; medium find 1.9 spills, 92,400 barrels; large find 6.9 spills, 335,700 barrels. The estimates of volume spilled dramatically state the oil spill hazards of tanker transportation.

(7) Other Spills of 50 Barrels or More

This category is a combination of spills over 50 barrels which had causes other than those discussed above. Accident records indicate a total of 15 such spills through 1973. Total discharge from these spills amounted to approximately 9,200 barrels. Twelve of these spills were attributed to overflow, malfunction, rupture or failure of platform piping valves or vessels.

One spill occurred during abandonment and platform removal. In this operation a well broke and spilled 500 barrels of oil. To help prevent recurrence of this type of spill, OCS Operating Order No. 3 requires that a redundant series of bridging devices, weighted muds, and cement plugs be placed in any well or drill hole prior to abandonment. Well and drill hole abandonments performed in this manner should provide an ample margin of protection to prevent future oil spills from abandoned wells or drill holes.

Two similar incidents, occurring in July, 1971 and January, 1973, caused spills totalling 7,100 barrels. Both of these spills were caused by damage to oil storage barges.

(8) Minor Spills

Starting in 1970, the Geological Survey required reporting of oil spills less than 50 barrels in size. Since then some 5,000 such minor spills have been reported. Table 109 lists the annual totals of minor spills by number, volume and source. Even though the number of minor spills each year has increased slightly during the 1970-1973 period, the total volume spilled has decreased substantially. Figure 84 shows the decreasing trend in volume of oil

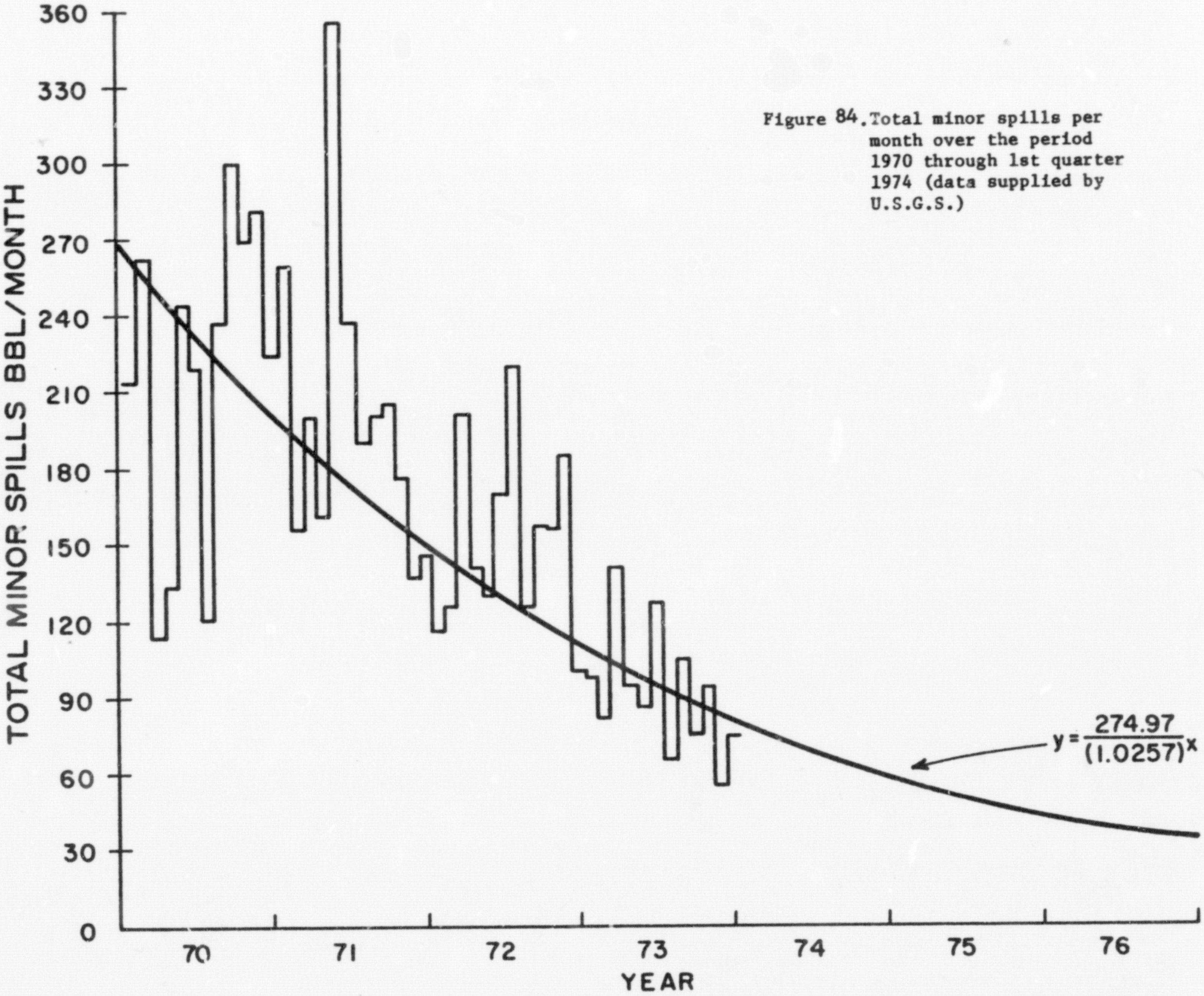

Figure 84. Total minor spills per month over the period 1970 through 1st quarter 1974 (data supplied by U.S.G.S.)

spilled per month during the 1970-1973 period. During this same period, the total OCS petroleum varied by less than 13 percent, whereas the volume of minor spills decreased by approximately 60 percent. This substantial decrease in the volume of oil spilled in minor spills probably indicates an improvement in industry's performance in cleaning up its routine operations and thereby reducing the amount of chronic spillage.

Table 109 Minor Oil Spills

Year	Total Number Reported	Number by Source		Total Volume Barrels
		Drilling	Prod. & Trans.	
1970	1,200	4	1,196	2,597
1971	1,250	13	1,237	2,414
1972	1,158	13	1,145	1,812
1973	1,392	10	1,382	1,857
Total	5,000	40	4,960	8,680

Note: Total OCS petroleum production during the 1970-1973 period was 1,488,242,300 barrels. Therefore, the minor spills spillage rate is 0.000583 percent.

(9) Summary of Throughput Spillage Rates

Each of the eight preceding subsections dealing with oil spills from OCS operations identified the volume of oil spilled for each class of accidents. With the exception of oil spills caused by blowouts, the volume spilled can be expressed as a throughput spillage rate, i.e., total volume spilled divided by total volume produced. Spill rates for blowouts are better expressed as blowouts per well drilled. This section brings all of these spillage rate estimates together. The reader is cautioned on three points.

First, as explained in detail in the preceding discussion, the quality of the data varies among the causes of accidents. For several accident categories, there are not sufficient data to allow extrapolations about expected future spill rates.

Second, it must be emphasized again that to date OCS oil and gas operations have occurred in only the Gulf of Mexico and off Southern California. The natural environmental conditions, i.e. severe storms, earthquakes, tsunamis and bottom types encountered in the frontier areas of the OCS will differ substantially from those experienced to date. Therefore, this historical accident data provides a questionable basis for predicting accident frequencies in areas such as the Gulf of Alaska or Georges Bank. This problem is discussed at length in Section III.C.

Third, as already noted, the statistical validity of throughput spill rates is questionable. The amount spilled from the same type of accidents can vary by a factor of 10,000 or more, e.g. the largest pipeline accident spilled over 160,000 barrels of oil and the smallest significant pipeline spill was less than 100 barrels. The presence of a single large spill in the accident history can seriously distort the mean spill rate especially when changes in OCS Operating Orders have substantially reduced the chances of another large spill. These observations among others lead M.I.T. to a different approach for estimating the hazards of future oil spills. The M.I.T. analysis of oil spills is presented in Section III.B.4.

These caveats aside, the throughput spill rates are shown in Table 110.

Table 110

Throughput Spill Rates

Accident Class	Spill Rate		
1. Pipeline accidents	.00170	percent	1/
2. Blowouts	.00290	"	2/
3. Explosions and Fires	.00290	"	
4. Severe storms	.00041	"	
5. Ship Collisions with Platforms	.00009	"	
6. Tanker and Tank barge	.01600	"	3/
7. Other Spills of 50 Barrels or More	.00032	"	
8. Minor Spills	.00058	"	
Total without tankers	.00890	"	
Total with tankers and without pipelines	.02320	"	
Total with both tankers and pipelines	.02490	"	

1/ Pipeline spill rate since 1970. See Section III B.3 b) 1)

2/ Blowouts expressed as throughput spill rate. An alternative expression is .035 percent of wells drilled blowout with an average spill of 2,100 barrels per blowout.

3/ The M.I.T. estimate of tanker throughput spill rate.

Explanation for Table 110

Throughput spill rates are based on historical experience. Using throughput spill rates as a basis for forecasting oil spill rates in the frontier areas of the OCS would require the following assumptions:

1) That oil spill prevention efforts are equally successful as they have been in the Gulf of Mexico and the Santa Barbara Channel OCS area;

2) That the different environmental conditions of the frontier OCS areas represent an equal hazard to OCS operations as the conditions encountered to date; and

3) That the historical observations provide a sufficient data base to accurately estimate spill rates.

There are substantial factual reasons for doubting the validity of each of these assumptions.

OCS Operating Orders have been changed to abate certain key oil spill hazards and as a result of these efforts oil spill rates should go down. However, the operating environments of the

Explanation for Table 110 (cont')

various OCS frontier areas include natural environmental phenomena not experienced in U.S. OCS operations to date. Finally the historical data on OCS oil spills provides an insufficient basis for forecasting throughput spill rates. These caveats about the use of historical data should be kept in mind when these throughput spill rates are used in Table 111 as a basis for forecasting future spill rates.

These estimates of throughput spill rates provide a basis for computing one type of estimate of the expected volume of oil spills in each OCS area. To make these throughput spill estimates, two additional pieces of information are necessary. Obviously, estimates of the expected production are required for each area. The U.S. Geological Survey provided the likely production estimates shown in Table 106. With the information presently available, these estimates of expected production are highly speculative.

The second piece of additional information needed to compute throughput spill rates is identification of likely methods of transporting the petroleum production for each area. Once again this information was requested from the Geological Survey. Specifically, the Survey was asked to determine for each area: (1) Whether pipelines or tankers and barges would be used to transport OCS oil and gas production to shore; and (2) whether the OCS oil and gas production of an area would be exported for consumption in another area. The USGS response was quite general. Tankers will be used to transport OCS oil to shore from deep water drilling sites. In all other instances pipeline transportation to shore was assumed. Additionally the Geological Survey assumed that all Alaskan OCS petroleum production would be tankered out for refining and consumption in another area. The Geological Survey did not base this response on elaborate or detailed studies of the likely transportation method for OCS petroleum production in each area.

Combining the information in Table 106 and 110 produces an estimate of the expected volume of oil spills for each area. The procedure is to use Table 110 to identify the total throughput spill rate appropriate for the expected transportation system for each area. Then by multiplication of this throughput spill rate by the expected production levels depicted in Table 106 the results presented in Table 111 are obtained.

The expected spillages shown in Table 111 are large. The basic reason for this is the very large expected production from the OCS areas. These estimates, being the product of the expected production and the appropriate total throughput spill rate, increase as the expected volume of oil and gas production increases. To place these estimated spill volumes in context, the expected magnitude of petroleum production for each area must be kept in mind. To date, the total of OCS petroleum production has been only 2.9 billion barrels. The proposal to accelerate OCS oil and gas leasing could result in production levels 6 to 30 times larger than the total of OCS production to date.

Table 111

ESTIMATES OF AVERAGE ANNUAL OIL SPILL VOLUMES BASED ON THROUGHPUT SPILL RATES
(Over the Life of the Field)

Areas	Average Annual Production (Million Barrels)		Throughput Spill Rate Percent (Table 109)	Average Annual Spillage (Barrels)	
	Mean	5%		Mean	5%
North Atlantic	45.00	71.43	.0089	4005	6357
Mid-Atlantic	72.00	131.42	.0089	6408	11,696
South Atlantic	20.00	43.33	.0089	1780	3856
MAFLA	50.00	77.14	.0089	4450	6865
MAFLA Deep	(25.00)	(43.33)	.0232	(5800)	(10,053)
Central Gulf & South Texas	126.67	160.00	.0089	11,273	14,240
DEEP	(36.00)	(54.29)	.0232	(8352)	(12,595)
So. California	44.00	60.00	.0089	3916	5340
DEEP	(48.00)	(82.86)	.0232	(11,136)	(19,224)
Santa Barbara	60.00	85.71	.0089	5340	7628
DEEP	(36.00)	(60.00)	.0232	(8352)	(13,920)
No. California	26.67	26.67	.0089	2374	2374
Washington-Oregon	13.33	23.33	.0089	1186	2076
Cook Inlet	48.00	68.57	.0249	11,952	17,074
Gulf of Alaska	60.00	134.29	.0249	14,940	33,438
Aleutian Shelf	6.67	8.00	.0249	1661	1992
Bristol Bay	35.00	68.57	.0249	8715	17,074
Bering Sea	88.00	175.00	.0249	21,912	43,575
Chukchi Sea	213.33	362.50	.0249	53,120	90,263
Beaufort Sea	110.00	190.00	.0249	27,390	47,310

Explanation for Table 111

The explanation for Table 110 expressed the necessary caveats about the use of throughput spill rates in forecasting future OCS oil spills. Table 111 presents estimates of annual throughput spill volumes. These estimates are obtained by multiplying the USGS estimates of undiscovered recoverable resources by the throughput spill rate appropriate for each particular OCS area.

Inspection of the column headed Throughput Spill Rate (Percent) reveals that each of the OCS areas is assigned an appropriate total throughput spill rate. This was done by noting whether or not tanker or tank barges would be used to transport OCS petroleum production to shore. Additionally, it was necessary to idencify whether the petroleum production of each OCS area would likely be consumed in that region or exported by tanker for consumption in another region. The following assumptions were used to specify whether pipelines only, tankers only, or pipelines and tankers would be used in transporting the OCS petroleum production of each area:

(1) For all deepwater areas, i.e. 200 meters to 2500 meters, tankers will be necessary to transport the oil to shore;

(2) All Alaskan OCS petroleum production will be pipelined to shore for storage then tankered out of Alaska for refining and consumption in other areas; and

EXPLANATION FOR TABLE 111 (cont')

(3) Oil production of all other [illegible] areas will be piped to shore and consumed in the adjacent coastal area.

The U.S. Geological Survey was the source of these assumptions. Because of the substantially higher throughput spill rates for tanker transportation as compared to pipeline transportation, these are very important assumptions. The potential for an error in these assumptions must be added to the other caveats, which were noted in the explanation for Tables 109 and 110 about the use of throughput spill rates and recoverable resource estimates as a basis for forecasting future OCS oil spill rates. When all of the assumptions necessary for the validity of throughput spill rates are considered it is highly doubtful that there is much if any meaning in these estimates. Certainly the absolute amounts of annual oil spilled should not be interpreted as having anywhere near the precision implied. This apparent numerical precision is an artifact produced when the two numbers are multiplied together. A far more reasonable interpretation of these throughput spill volumes is obtained by grouping the estimated volumes into categories such as high, moderately high, moderate, and low. The results of such a categorization are:

High	53,120 barrels/year	Chukchi Sea
	27,390 barrels/year	Beaufort Sea
	21,912 barrels/year	Bering Sea
	19,697 barrels/year	Central and Western Gulf of Mexico shallow and deep

Moderately High	15,148 barrels/year	Southern California shallow and deep
	14,940 barrels/year	Gulf of Alaska
	13,764 barrels/year	Santa Barbara shallow and deep
Moderate	11,952 barrels/year	Cook Inlet
	10,300 barrels/year	MAFLA shallow and deep
	8,715 barrels/year	Bristol Bay
	6,408 barrels/year	Mid-Atlantic
	4,005 barrels/year	North Atlantic
Low	2,374 barrels/year	North & Central California
	1,780 barrels/year	South Atlantic
	1,661 barrels/year	Aleutian Shelf
	1,186 barrels/year	Washington & Oregon

These annual spillage rates are based on the Geological Survey best estimate (mean) of the expected oil production for each area.

It is important to note the assumption that all deep water production will be tankered to shore drastically increased the throughput spill volumes for the deepwater areas. This assumption could be wrong. If it is, the categorization would change.

4. Probabilities of Oil Spills Larger Than 1,000 Barrels - The MIT Analysis

Throughput spill rate computations represent one method of estimating the expected severity of future oil spills. An important alternative method was developed by ECO, Inc., and the Massachusetts Institute of Technology for the Council on Environmental Quality (1974).

MIT focused its analysis on the frequency and magnitudes of OCS oil spills with the intent of developing probability estimates for such events as: oil spills greater than 1,000 barrels in the life of a field, the time elasped between spills larger than 1,000 barrels and the expected number of spills in the life of the field. The sophisticated statistical techniques utilized by MIT are beyond the purview of this discussion. However, the results of the MIT are presented in this subsection. Sources of data used in their study were:

- Coast Guard Pollution Incident Report System
- ECO, Inc., data base on tanker casualties (1960-1972)
- Petroleum Systems Reliability Analysis Data base generated by Computer Sciences Corporation for the Environmental Protection Agency
- MIT data base on large spills
- A sample of 300 spills at single point moorings worldwide, principally from testimony at hearings before the House of Lords on a proposed Anglesey, England, terminal.

Important characteristics of oil spill data include the following:

- Amounts spilled in accidents of similar cause can vary by at least a factor of 100,000.
- The presence of a few very large spills in the historical record can substantially distort the statistical distribution of spill magnitudes.
- The fluctuations from year to year are quite large.

All of these factors tend to make for meaningless estimates of average amounts of oil that might be spilled at particular steps in the development process.

a. Platforms and Pipelines

For a small oil field discovery there is about a 25 percent chance of one platform spill over 1,000 barrels; there is about a 70 percent chance of one platform spill for a medium field and for a larger field, the probability of at least one spill larger than 1,000 barrels is approximately 95 percent. The probability of pipeline spills follows the general pattern exhibited by platform spill probabilities.

Biologically, the time interval between large spills may be at least as important as the number of such spills. The probability of successive oil spills increases rapidly as the size of the field increases. Specifically, the expected time interval between large spills (over 1,000 barrels) for a small field is 4-5 years; the corresponding time interval for a medium field is approximately 2 years; and for a large field, it is only one year.

b. Tankers

The material reported in this subsection was presented above in Section III.B.3.b.⑥. It is repeated here for convenience.

Analysis of tanker spill statistics indicates that if tankers are used to transport oil to shore, the probability of at least one oil spill over 1,000 barrels is about 27 percent during the life of a small find, about 85 percent for a medium find, and nearly 100 percent for a large find. The expected time interval between spills larger than 1,000 barrels is approximately 2.5 years for a small find, slightly over one year for a medium find, and slightly over one half a year for a large find.

c. Total Number and Volume of OCS Oil Spills

The total volume spilled over the life of a field can also be estimated using the MIT approach. First, the expected number of spills over 1,000 barrels is estimated for each field size. Then the expected volume spilled can be computed by multiplying the expected number of spills by the expected spill size for each class of accident. Table 112 depicts the results of these computations for small, medium, and large field sizes. Platforms have the lowest frequency and volume of spills, and tankers the highest. Once again,

TABLE 112

Oil Spilled Over the Life of a Field

	Number of Spills	Total volume (barrels)
Small Find		
Platform	0.28	7,200
Pipeline	0.31	13,900
Tanker	0.41	19,000
Medium Find		
Platform	1.3	33,300
Pipeline	1.4	62,900
Tanker	1.9	92,400
Large Find		
Platform	4.7	120,500
Pipeline	5.2	233,300
Tanker	6.9	335,700

Source: Massachusetts Institute of Technology, "Oil Spill Trajectory Studies for Atlantic Coast and Gulf of Alaska," Primary, Physical Impacts of Offshore Petroleum Developments, prepared for the Council on Environmental Quality under contract No. EQC330 (Cambridge: Massachusetts Institute of Technology, 1974), Report No. MITSG 74-20.

there is a rather marked difference between the oil spill hazards of pipeline and tanker transportation of OCS petroleum products.

In principle, it is possible to use the MIT approach to analysis of oil spill statistics to compute estimates of likely oil spill volume for each OCS area. The computations would have essentially the same steps used above in the total throughput estimates of oil spill volumes. However, an estimate of the expected number and sizes of petroleum finds for each OCS area would replace the use of expected total production. The Geological Survey did not express their estimates of the expected magnitude of oil and gas resources in this fashion. Therefore, the necessary data for estimates based on the MIT estimates are not available and these estimates are not made.

5. Accidental Deaths and Injuries on OCS Industry Structures and Vessels

Deaths and injuries on oil industry OCS platforms and onboard vessels are a serious problem. Working in the offshore oil business is hazardous. Data supplied by the U.S. Coast Guard reveals that 100 individuals were killed as a result of accidents involving construction, supply and drilling vessels, workboats, mobile drill rigs, and artificial islands in the Gulf of Mexico and adjacent inland waters during the 1964-1973 period. Between 1967 and 1973, 41 deaths occurred in the Federal OCS international waters from accidents involving vessel damage. These figures do not include deaths resulting from accidents in which no vessel or rig damage occurred (i.e., persons falling, or knocked overboard, crushed by drilling equipment, etc.). Furthermore, the Coast Guard data are not complete for the years 1964-1966. Therefore, the Coast Guard data must be supplemented with data from other sources. One such source is injuries reported to the Office of Workmen's Compensation Programs under the Outer Continental Shelf Lands Act. In addition to the deaths from accidents involving damage to equipment, approximately 21 deaths occurred in accidents not involving damage to vessels. Thus, approximately 62 deaths occurred in Federal OCS oil and gas operations in the 1967-1973 period. The Geological Survey's report of accidents associated with Federal oil and gas operations in the OCS of the Gulf of Mexico and the Pacific areas between 1964 and 1973 lists 64 deaths and 154 injuries.

C. Natural Phenomena in Each OCS Area and Their Impact Generating Potential

OCS oil and gas development operations will at times be subjected to the stress of severe storms, ice, earthquakes, tsunamis, and unstable bottom conditions. These differences in the natural environmental conditions that can cause impacts on OCS oil and gas operations provide another means of assessing the relative environmental hazards in each OCS area.

This section is based largely on a study prepared by Tetra Tech, Inc. for CEQ 1/. Tetra Tech, Inc. evaluated the likelihood of natural environmental occurrences and their possible impacts for the three Atlantic OCS areas and the Gulf of Alaska. It was necessary to supplement the Tetra Tech analysis with information about the other OCS areas. Extensive information about the various Alaska OCS areas was obtained from a report done by Battelle Memorial Institute for the U.S. Coast Guard. 2/

The Tetra Tech report divided the petroleum production system into four groupings: those used for exploration, for production, for storage, and for transportation. The Battelle study used essentially these same divisions.

Before doing an area by area analysis, it is necessary to establish how each environmental condition can impact each constituent part in the OCS oil and gas development system. The environmental stresses to be considered are severe storms, ice, earthquakes, tsunamis, and unstable bottom conditions. The constituent phases of the oil development process are: exploration, production, storage and transportation.

1/ The Effect of Natural Phenomena on OCS Gas and Oil Development, Volume 3, OCS Oil and Gas--An Environmental Assessment, CEQ, April 1974.

2/ Geophysical Analysis of Oil Spill Potential Associated with Alaska Oil Production and Transportation Systems, W.H. Swift, R. E. Brown, L. V. Kimmel, M.M. Orgill, P. C. Peterson, W.W. Waddell, Department of Transportation, U.S. Coast Guard, February 1974.

1. Exploration Phase

If during exploratory drilling the drilling platform collapses, capsizes, or moves from the drilling site the marine riser will fail and small volumes of drilling muds and cuttings will be released into the sea. If the drilling has penetrated oil and gas formations, there is also the possibility of a blowout. If sufficient warning is given, all wells can be closed so that chances of a blowout are substantialy reduced.

Severe storms can affect both floating and fixed platforms. Experience to date indicates that industry has had a certain measure of success in scaling up Gulf of Mexico technology to meet the more hostile storms found in the North Sea. Losses have occurred, however. Since 1965, severe weather was either a prime or contributing factor in the loss of 10 drilling rigs. Prudent operation of a rig dictates that drilling operations stop when weather conditions exceed the operational limits specified in the design. Experience with the severe storm environment in the North Sea shows approximately a 14 percent average annual downtime due to bad weather.

Earthquakes affect exploratory drilling in more complex ways. Fixed platforms can be subjected to severe shaking and the stress attendant to these accelerations. Additionally, a number of earthquake related events can disrupt the foundation of the platform. Earthquake hazards to fixed platforms can probably be mitigated by proper design and careful placement to avoid bottom types prone to ground rupture, differential settlement, landslides or liquefaction of sediments. Floating drilling rigs are less vulnerable than platforms. They would be only slightly affected by local tsunamis and not at all by earthquakes.

Ice in sufficient quantities can present a significant hazard to almost any offshore structure. The hazards of moving ice packs or the threat of ramming by ice islands represent environmental phenomena beyond the present limits of technology. The truly awesome forces exerted by large ice flows, especially ice islands, which can score 30 foot deep trenches on the seafloor, simply preclude Arctic drilling operations except for about two months in the summer. Thus, ice which is not viewed as a serious problem in areas other than the more northern Alaskan areas, represents a technological barrier to offshore drilling in the Arctic. However, recent technical developments may offer a means of enduring ice pressures. General Dynamics has developed a design concept for a moored drilling system that includes a cone-shaped hull that is "squeezed" upwards by ice pressure until the weight of the hull breaks the ice. The system is designed to operate in depths up to 660 feet and fastice accumulations up to 5 feet. Global Marine has also been developing an ice breaking drill ship which employs a Pneumatically Induced Pitching System

(PIPS) to break ice. With new technologies such as these, drilling in Arctic waters may become technically feasible. However, neither of these systems has been field tested.

Unstable bottom conditions were not dealt with in the Tetra Tech study. However, the Federal OCS operating experience has demonstrated that unstable bottom sediments can pose a serious threat to bottom fixed structures. This problem can in most areas be circumvented by careful analysis of bottom sediments as part of the drilling rig and production platform siting process.

2. Production Phase

Almost all offshore production systems installed to date are fixed steel frame platforms. An emerging alternative to fixed production platforms is the subsea production system (subsea completions) which involves placing the wellheads on the ocean floor rather than on platforms. As water depth increases, the costs of fixed platforms rapidly increase and this increasing cost is one reason for developing the subsea completion technology. The increasing cost of production platforms has also lead to an increase in the number of wells that each platform must service. Modern platforms are able to serve 20 to 25 wells. Future platforms can be expected to service 40 or more wells. The more wells there are on a platform, the more serious the consequences of damage to the platform.

Fixed production platforms face the same natural hazards as the fixed platforms used in exploration. Severe storms are not as hazardous as they are disruptive. Production operations taking place on fixed platforms should not be seriously disrupted by the vast majority of severe storms. Further, prudent operating practices dictate shutting down production, closing the wells and abandonment of the rig during truly severe storms. Of course, advance warning of impending severe storms is necessary and in many of the Alaska OCS areas, expected warning times might be as short as one or two hours. Subsea completions generally avoid the hazards of severe storms.

Earthquakes can and do result in numerous events disruptive of OCS oil and gas production facilities. Among these are: (1) ground vibration, (2) ground rupture, (3) landslides including subaerial and submarine rock slides, avalanches and mudflows, (4) liquefaction of sediments, (5) differential settlement and (6) seismic sea waves (tsunamis) and seiches. All of these events occurred as a result of the March 27, 1964, Alaska earthquake in Prince William Sound. The Cook Inlet oil and gas wells evidently were not appreciably damaged. Some damage could have resulted in 1964 if the present extensive development of these fields was present. Still, in view of the intensity of the Prince William Sound quake (Richter 8.3-8.75), the lack of damage to the Cook Inlet petroleum fields speaks well for current structure design capabilities in earthquake prone areas.

This is not to say that earthquakes will not damage petroleum fields. Damage is more likely to result where local features or situations develop, such as surface rupture, where a fault crosses a well and is offset as a result of movement, or where subaerial or submarine landslides cut a subsea completion or topple a production platform. Such events can occur as a result of earthquakes of far less intensity than the Prince William Sound quake. Destruction considerably out of proportion to the intensity of the quake can occur in localized areas where fortuitous conditions are present. Therein lies the major concern. However, as industry gains additional experience in coping with seismic events, these hazards should be reduced. For example, a 940 foot steel frame platform has been designed, but not yet installed, for use in the earthquake-prone Santa Barbara Channel area. This platform is designed to withstand the maximum expected ground shaking in the Santa Barbara Channel.

The landslides, liquefaction of sediments and differential settlement of sediments associated with earthquakes represent additional hazards for OCS development in seismically active areas. Once again, the awesome Prince William Sound earthquake provides examples of the disastrous effects of such events. Persons interested in the details of the findings related to the Prince William Sound quake are referred to the summary presented in U.S. Geological Survey Professional Paper 546. Avoidance of areas of potentially unstable bottoms is the only known method of preventing accidents caused by these major land movements. Extensive test boring programs must be conducted prior to siting production platforms in seismically active areas. This is particularly important because there is no advance warning of impending earthquakes.

The potentially disastrous effects of tsunamis are not expected to pose a serious hazard to the majority of offshore production platforms or subsea completions. Decreasing water depths and amplification by coastal features are the primary intensifiers of the destruction forces of tsunamis. In water depths greater than 200 feet or more tsunamis are expected to cause no damage. The postulated wave heights of tsunamis are considerably less than the design wave height of OCS drilling platforms.

Ice related hazards to OCS production arise from four principal sources. First, ice accretion on surface structures increases their weight, freezes equipment and is a safety hazard Heating coils and similar devices can mitigate the hazards of ice accretion. Moving pack ice poses more serious hazards in the Alaskan Arctic areas. Offshore production platforms will face many of the same problems as drilling rigs. Modified conventional platforms may be possible, but in general, new technology such as subsea completion systems for deeper water and artificial islands for shallower water will have to be developed before production is practicable in Arctic areas.

Ice islands present a particularly difficult problem for Arctic petroleum development. These islands can be over 200 feet thick and range from a few thousand square feet to a few hundred square miles in size. Drift rates can exceed one mile per day. If a truly large island drifts into a drilling platform or even an artificial island, the petroleum production structure will likely be destroyed. It may be possible to protect OCS structures from drifting ice islands by using large ships to tow these islands away from OCS structures. Subsea completions would avoid this hazard in deep water. However, in shallow water where ice islands ground, scouring of trenches 30 feet deep can occur. Obviously subsea completions and pipelines subjected to such forces would fail.

3. Storage Phase

There are three types of storage devices used for OCS petroleum production. The most common is the familiar cylindrical oil storage tank used onshore. Offshore storage in either floating or submerged vessels is also possible. The volume stored in all three types of storage devices is very large. Tank sizes are rarely smaller than 200,000 barrels and can be as large as 1,000,000 barrels. Even larger tanks are being proposed.

Onshore, storage tanks can be damaged or destroyed by flooding, by tsunami waves, by earthquake shaking and by the various forms of soil movement frequently associated with seismic events. Damage from flooding and tsunamis can be prevented by proper site location. The same is true for avoiding damage due to loss of soil stability. The ground vibrations of earthquakes can cause sloshing movements in storage tanks which can intensify into overturning movements and cause buckling of base ring and subsequent collapse of the structure. This hazard can be reduced by minimizing the free surface within the tank. Even if damage should occur to onshore storage tanks, secondary protection against oil spills is provided by surrounding the tanks with dikes capable of containing the total amount of stored oil. Severe natural phenomena are least likely to affect onshore storage systems.

Both forms of offshore storage can be subjected to the forces of severe events such as storms, tsunamis and moving ice. The principal hazards for floating storage tanks result from the damages inflicted by grounding or capsizing. Breaking mooring lines is the event that sets floating storage tanks adrift. The likelihood of grounding can be reduced by anchoring floating storage tanks in deep water. This same deep water will allow tsunamis to pass without damage. Deep water moorage far from shore also allows more time to recover an adrift storage tank. Capsizing can also be avoided by special design. Storage tanks which are long and thin and float nearly submerged will not likely capsize. The Shell Corporation has built a 300,000 barrel storage tank of this type for use in the North Sea.

Underwater storage tanks are susceptible to damage from severe storms, earthquakes and tsunamis. The passage of large waves during severe storms generate considerable forces. In shallow water, these forces penetrate to the bottom. Surrounding storage tanks with wave attenuation barriers will abate these forces and protect the storage tank. This type of system is being installed at the Ekofisk field in the North Sea.

Underwater storage tanks are particularly vulnerable to earthquakes and tsunamis. The ground vibrations of earthquakes produce large drag and inertial forces on these bulky structures. For more severe earthquakes, these forces can easily exceed those associated with severe storms. If the underwater storage tank survives the earthquake forces, there are still the tsunamis forces to endure. As the tsunami passes, the mean water level increases thereby increasing the bouyant forces. At depth, the passing tsunami increases drag and inertial forces to levels considerably higher than those associated with severe storms. Each of these facts probably makes underwater storage impractical for seismically active areas of the OCS.

Both surface and underwater storage tanks can be impacted by moving ice. Floating storage is obviously more vulnerable but large ice islands can ground submerged storage tanks unless these structures are secured in water depths sufficient to allow even the largest ice islands to pass over freely.

Oil spill containment will be very difficult for both floating and submerged oil storage tanks. The ease of spill containment around onshore storage tanks alone would make onshore storage less hazardous. For areas where storage on shore areas is impractical due to large distances to shore, floating storage can be used but such storage will be more hazardous. In general, the hazards of underwater storage would probably rule out this storage method except perhaps for certain Arctic areas.

4. Transportation Phase

Transportation of OCS oil and gas production can be separated into two segments. Gathering of the production from adjacent producing areas to concentrate a volume sufficient for economical shipment is the first step. The extent of such gathering systems is directly related to the production rates for the petroleum reservoirs. For highly productive fields, gathering systems are typically not as extensive as those needed in less productive fields. Pipelines are the most common transportation means used in gathering systems in the Gulf of Mexico OCS fields. Barges and small tankers moored adjacent to platforms are an alternative gathering system-transportation mode.

Movement of the petroleum production out of the OCS field is the second segment of the OCS transportation system. In areas where the OCS production will be consumed in the adjacent shore area, the production gathered from adjacent tracks is moved to shore areas either by pipelines or tankers and tank barges. Where the OCS production is not consumed in the adjacent coastal areas, it must be exported. As discussed above, storage of OCS petroleum production prior to transshipment can be either onshore or at sea. If onshore storage is used, the transportation system is subjected first to the hazards associated with the mode of movement to shore. Then, there are the hazards of storage and finally the hazards of the export transportation system. In areas where at-sea storage is practical, single point moorings can be used to load tankers for transshipment. In general, this system should be less hazardous than moving the production to shore storage areas and loading tankers in coastal areas. Most of the petroleum production of the Alaskan OCS areas will be exported for consumption in other areas. This fact alone is sufficient to make Alaskan OCS petroleum production more hazardous than OCS areas where the petroleum production is consumed in the adjacent areas.

a. Pipelines

Historically, pipelines have been the safest means of bulk transportation. This is expected to continue in the frontier areas of the OCS. Pipelines are, however, subject to damage from natural phenomena. Elaborate route selection and engineering studies coupled with seismic and test boring programs could minimize the likelihood of having the pipeline traverse areas of unknown soil properties. Where pipelines traverse fault zones or other regions of poor soil stability, installation of check block and pressure relief valves on both sides of the hazardous areas would help to minimize spillage if the pipeline should break. The required burial of pipelines in water depths less than 200 feet should provide protection against anchor dragging which has been the cause of most major pipeline breaks.

In the Arctic and subarctic areas of Alaska, pipelines will be exposed to the additional hazards of ice and permafrost. The forces ice can exert are substantially greater than those a pipeline can endure. Therefore, pipelines will have to be constructed and placed in ways that will avoid exposure to ice. This requirement can pose some formidable problems. As already noted, ice islands can scour the sea bottom to depths of 30 feet. Similar hazards are encountered at shoreline. The accumulation and movements of ice along the shore in the fall and spring could subject the pipeline to crushing loads of folded ice in the fall and tearing and shearing forces during the spring breakup.

Permafrost must be completely avoided, completely eliminated, or completely preserved in all phases of OCS petroleum production. Little is known regarding the presence and extent of permafrost under the oceans. However, where it exists under the oceans it should pose the same problem it does to pipelines onshore. The heat of the pipeline causes melting. The melted permafrost may have considerable potential for solifluction or downslope movement. Additionally, where freezing occurs over a deeply buried pipeline (assuming deep burial is adopted to avoid ice hazards) the melted permafrost around the pipeline will be an incompetent layer sandwiched between two frozen and rigid layers. The rigid surface layer is then subject to heaving, cracking and rupture especially during earthquakes. Building the Trans Alaska Pipeline has given industry some experience in permafrost problems and as a result, pipeline placement in areas of permafrost is less hazardous today than it was, say, five years ago.

b. Tankers

Tankers constitute one of the most serious oil spill hazards of any OCS operation. Historical data indicate that the majority of tanker oil spills resulted from groundings, collisions, and structural failure. Natural phenomena such as severe storms, high winds, or fog often contributed to past tanker accidents. However, in virtually every case, the accident could have been avoided by proper maintenance of the vessel and/or use of prudent seamanship either to avoid severe storms or to modify course or speed and thereby minimize wave forces while trapped in bad weather. Even with proper maintenance and use of prudent seamanship, tanker operations will be more hazardous in the more arduous frontier OCS environments.

Tsunamis pose a serious threat of major oil spillage whenever tankers moor at fixed berths in tsunami-prone areas. Moored at a fixed berth, the tanker is in shallow water where tsunamis develop their most destructive forces. Mooring lines part and the vessel is at the mercy of the waves and currents until the engines generate sufficient thrust to regain steerage. During the Prince William Sound earthquake, the tanker Alaska Standard, moored at Seward, was carried several hundred yards out into the harbor. In Valdez, a freighter was not so lucky. The mooring lines on the Chena parted when the land at shoreline slumped. The freighter was first sucked away from the pier by the outrushing water (during tsunamis the water first rushes outward before the tsunami wave, augmented by the outward rushing water, hits with destructive force) and was then thrown onto the mud flats by the reflected wave. Similar occurrences have been observed wherever ships have been moored when a major tsunami hit.

The hazards of tsunamis in harbors can in many cases be avoided by use of single-point moor oil transfer facilities placed in deep water and away from the shoreline. In deep water, tsunami wave forces are negligible. In the event the moor parts, which is far more likely during severe weather than passage of a tsunami, the ship will have maneuvering room to regain control.

Ice is a major hazard in the more northern OCS areas particularly in the Alaskan arctic and subarctic areas. Three types of ice exist in the northern seas. (1) Icebergs or ice islands which are drifting remnants of ice broken off from continental ice masses. In the Arctic, ice islands are a major hazard. (2) Winter ice which forms each year occurs in the many openings scattered throughout the polar ice pack as well as in the open water of the adjacent seas. In the warmer, more southern areas of Alaska, winter ice forms principally along the shore. In the Arctic, winter ice also forms as the Arctic Ocean freezes to an average depth of 6 to 8 feet. Along the shore, winter ice can be piled by the tides into ridges over 40 feet thick. Strong winds and currents as well as the spring thaw break off fragments of the winter ice, forming winter drift ice. (3) Ice that forms over several years is known as polar ice. The thickness of polar ice in the Arctic is normally 10 to 13 feet by the end of winter, decreasing to about 6 to 10 feet in the summer. Strong winds often push large polar ice flows in shore through areas of thin seasonal ice causing the winter ice to break and pile up into larger pressure ridges. These ridges can be over 40 feet high with keels over 120 feet deep. These keels frequently ground and scour the bottom.

Tankers are very vulnerable to ice. Even drift ice can make normal tanker operations hazardous. However, the Manhattan experiment demonstrates that it may be possible to design ice-strengthened merchant ships which are capable of Arctic operations during summer months. Even the largest icebreakers built to date are not capable of operating north of the Arctic Circle during the winter and spring. Perhaps submarine tankers can be designed to operate under the polar ice much as the atomic submarine Nautilus did in 1958. Studies have indicated that transportation of Arctic oil in submarine tankers is feasible using the Northwest Passage to Greenland.

5. Summary

Table 113 summarizes the effects of natural phenomena on each element in the OCS oil and gas development system. For each element in the OCS development system, the volume of oil spillage which could result from an incident is identified. The potential volume spilled is a big factor in assessing the relative risk (even a low probability of a very large spill is serious). The columns of Table 113 are the various natural phenomena discussed above. With the exception of the column for ice, this table is identical to Table 14 in the Tetra Tech report. The caveats noted are also taken from the Tetra Tech report. Additional footnotes were added to express the caveats about the assessment of the relative hazards of ice. (Footnotes 12-18.)

Interpretation of Table 113 is the essence of this evaluation of how natural phenomena might affect OCS operations without reference to the particular conditions which might be expected in any given OCS area. With this table, an area by area assessment requires nothing beyond noting the relative severity of each environmental phenomenon for each OCS area. The salient findings of this generic evaluation of environmental hazards are expressed below.

(1) Severe storms present no more than a moderate hazard to any of the elements of the OCS oil and gas development system. Both floating and underwater storage are rated as a moderate hazard because of the large volume of potential spills and the expected difficulties of containment of such

Table 113

Effects of Natural Phenomena on Elements of Oil Production

Natural Phenomena

Element	Severe Storm	Earthquake		Tsunami	Ice		Volume of oil at risk per event
		Vibration	Soil Stability		Accretion	Floating	
Platform	slight 1/	slight 2/	slight 3/	none	slight 12/	moderate 14/	500-1, 500 barrels per well per day
Pipeline	none	none	serious 4/	none	slight 13/	serious	10,000 barrels or more
Ashore	slight 5/	slight 6/	slight 3/	none	slight 13/	none	Up to 1,000,000 barrels or more 7/
Afloat	moderate	none	slight 8/	none 9/	slight 13/	serious 16/	200,000 to 1,000,000 barrels
Underwater	moderate	serious	serious	serious	none	none 17/	100,000 barrels or more
Underway	slight 10/	none	none	none	slight 12/	moderate 18/	
Moored-SPM	slight 11/	none	slight 11/	none 11/	slight 12/	moderate 18/	500,000 to 2,000,000 barrels
Fixed berth	slight	none	none	serious	slight 12/	moderate 18/	

1/ Storm forces in the Atlantic and Alaska are comparable to those in the North Sea.

2/ Provided earthquake resistant design features are used.

3/ Provided careful soil analysis program is followed.

4/ It may be possible to reduce threat by line routing over less susceptible areas.

5/ Provided tanks are sited away from flood-prone areas.

6/ Provided free surface effect is reduced.

7/ Dikes give protection against damaging oil spill.

8/ Assumes control can be regained before floating storage grounds or capsizes.

9/ Provided floating storage is moored in deep water

10/ Assumes regular inspections and prudent seamanship

11/ Assumes ship control is regained before gounding

Source: Tetra Tech, Inc., 1973, "The Effect of Natural Phenomena on OCS Gas and Oil Development," prepared for the Council on Environmental Quality under Contract No. EQ4AC010.

The columns describing ice hazards were prepared by the Department of the Interior as were footnotes 12-18.

12/ Slight hazard to structure with considerable hazard to personnel.

13/ Slight hazard to structural integrity.

14/ Assuming platforms are protected by artificial islands or other protective barriers. Ice islands would be a serious hazard to unprotected Arctic platforms.

15/ Bottom scouring by ice islands may reach 30 feet deep. Burial of pipelines 30 or more feet below the sediments may be technically infeasible.

16/ Rammings by ice islands.

17/ Provided underwater storage tanks are at depths sufficient to allow ice islands to pass over them

18/ Drift ice and pack ice are barriers to conventional tanker operations. The Manhattan experiment demonstrated that modified tankers could perhaps operate during summer months.

Explanation for Table 113

This table categorizes the relative oil spill hazard posed by each natural phenomenon as none, slight, moderate and serious. These categories are essentially equivalent to the categories, low, moderate, moderately high and high used in the other tables of this chapter. The categories reported in Table 113 correspond to those used in the Tetra Tech report. When the results of this table are used in the area by area assessment of relative environmental risk from natural phenomenon for each area, the high, moderately high, moderate, and low categorization of the relative risk will be used.

spills during severe storms. The probabilities of spills caused by severe storms were found by Tetra Tech to be very small.

(2) Ground vibrations of earthquakes are rated as a serious hazard to underwater storage. The reasons for rating earthquake vibrations as only a slight hazard to platforms and onshore storage are noted in the footnotes.

(3) The effects of earthquakes on soil stability are classified as representing a serious hazard to pipelines and underwater storage and a slight hazard to all other operations except tankers moored at SPM's. Tetra Tech rated ground stability as posing no hazard to tankers moored at fixed berths. Experience during the Prince William Sound earthquake indicates that perhaps Tetra Tech is incorrect in this evaluation (the Chena experience discussed earlier). Tetra Tech reported this as a tsunami hazard and in Table 113 it is reported as a ground subsidence hazard, hence the "serious" rating in brackets. Massive subsidence of sediments is an earthquake-generated hazard which may occur in areas which would normally be protected from tsunamis.

(4) Tsunamis represent a serious hazard to underwater storage and tankers moored at fixed berths. Otherwise, tsunamis do not represent hazards to the OCS oil and gas development system.

(5) Ice is a natural phenomenon not discussed at length in the Tetra Tech study. Accretion of ice on platforms and moored tankers was rated as a moderate hazard because of the increased danger of accidents under these adverse operation conditions. However, the accidents at issue should by and large not endanger the platform or vessels; therefore, the volume of oil at risk per event is not large.

(6) Floating ice is identified as a consistent hazard for nearly all steps in the OCS oil and gas development system. The distinction between serious and moderate hazard was often based on scant information as compared to that used in the Tetra Tech report. In reality, rammings by ice islands pose a serious hazard to any exposed OCS structure. The reasons for reducing this serious hazard to moderate typically involved an identified means of partially avoiding the destructive forces or ice islands.

Interpretation of Table 113 requires considerable caution. First of all, reading across the rows presents a subjective categorization of the hazard associated with each environmental phenomenon for the given component in the OCS petroleum development system. For example, reading across the row for pipelines reveals that both floating ice and earthquake related loss of soil stability poses a serious hazard to pipelines,with 10,000 barrels or more at risk per event. This should not be interpreted as saying that both earthquake induced loss of soil stability and ice islands have the same probability of causing a pipeline oil spill. A correct interpretation is that if anearthquake induced loss of soil stability occurs or if a pipeline is scoured by an ice island the pipeline will almost invariably fail, releasing 10,000 or more barrels of oil. Similarly, the assessment of the severe storms hazard to pipelines as "none" should be interpreted to mean that even the worst storm acting alone should not cause pipeline failure.

Another important fact to keep in mind when interpreting this table is the fact that the subjective categorization of relative risk should be read across the rows but not down the columns. This is necessary because the volume of oil at risk per event differs substantially between the various rows. For example, floating ice represents a serious hazard to a pipeline, but only 10,000 barrels of oil is at risk per event while floating ice represents a moderate hazard to tankers with 500,000 to 2,000,000 barrels of oil at risk per event. From an environmental viewpoint, a moderate risk of a 500,000 to 2,000,000 barrel oil spill is likely a more serious hazard than a serious risk of a 10,000 barrel oil spill. Table 113 represents an assessment of the ability of the various natural environmental phenomena to cause failure of the various components of the OCS petroleum development system.

Table 113 can, with caution, be read down the columns. It is important to note both the relative hazard assessment and the volume of oil spill at risk for each component of the OCS oil and gas development system, i.e. the column headed "Volume of Oil At Risk Per Event". Doing this produces the following results:

(1) Severe storms pose a moderately high hazard to floating and underwater storage with 200,000 to 1,000,000 barrels at risk per event;

(2) Earthquakes (both vibration and soil stability) pose a high hazard to pipelines with 10,000 barrels or more at risk per event; a high hazard to underwater storage with 100,000 barrels or more at risk per event; a moderate hazard to platforms with 500 to 1,500 barrels at risk per event; a moderate hazard to shore storage with up to 1,000,000 barrels at risk per event; and a moderate hazard to tankers moored at SPM facilities with 500,000 to 2,000,000 barrels at risk per event;

(3) Tsunamis poses a high hazard to underwater storage with 100,000 barrels or more at risk per event; and a high hazard to tankers moored at fixed berths with 500,000 to 2,000,000 barrels at risk per event;

(4) Ice accretion poses no more than a slight hazard to any of the components in the OCS oil and gas development system;

(5) Floating ice particularly ice islands, pose a high hazard to pipelines with 10,000 barrels or more at risk per event; a high hazard to floating storage with 200,000 to 1,000,000 barrels at risk per event; a moderately high hazard to platforms with 500 to 1,500 barrels at risk per event; and a moderately high hazard to all tanker operations with 500,000 to 2,000,000 barrels at risk per event.

6. Area by Area Evaluation of Natural Phenomena Oil Spill Risks

Estimation of the likelihood of an OCS oil and gas development system component being damaged or destroyed by natural phenomena requires considerable information about severity of the natural environment in each OCS area as well as a lot of assumptions about the specifics of OCS development technology. Tetra Tech in their report to CEQ quantitatively assessed the likelihood of oil spills from each natural phenomenon for the Gulf of Alaska and the

Atlantic OCS areas. This approach was to assume that OCS systems components were designed to endure the forces of the 100 year environmental event, e.g. worst storm in 100 years, with a safety factor of 1.5 and 2. Alternatively, the 200 year event was selected with the same safety factors. Using this approach, it was possible to estimate from historical data about the environmental factors recurrence relationships which express the intensity of an event and its probability of occurrence. Then, by specifying the anticipated duration of the OCS operations, it was possible to obtain an estimate of the likelihood the environmental variable would exceed the alternative design specifications and safety factors. These design and safety factors were specified for each of the four components in the OCS oil and gas development system and the probability of accidents estimated for each environmental variable.

Tables 114,115 and 116reproduce the Tetra Tech results. A specific example should clarify how to read these tables. Consider a platform operating for a 30-year field life in one of the Atlantic OCS areas which was designed to withstand the 100 year storm with a margin of safety of 1.5. Table 114 shows a .14 possibility of platform collapse during the assumed 30-year field life. If subsurface blowout preventers were used which were 95 percent reliable, the chances of a blowout would be .0056. If the reliability of the blowout preventers was improved to 99 percent, the chances of a blowout reduce to .0014. Further, during an assumed 30 year field life, a structure which was engineered to withstand a Richter 6.6 earthquake with a 2.0 safety factor would have a .014 probability of a blowout assuming 96 percent reliable blowout preventers or, .0035 probability of a blowout assuming 99 percent effective blowout preventers. Tables 115 and 116 read in a similar fashion except they depict Tetra Tech's estimates of natural phenomena-caused damage to the storage and transportation phases of the OCS oil and gas development system.

The Tetra Tech results reported in Tables 114, 115, and 116 are very interesting in that they depict the same pattern found in the evaluation of the oil spill hazards posed by each environmental variable for each phase in the OCS development system reported in Table 113. The difference is Tables 114, 115, and 116 express the same analysis in quantitative terms. In light of the assumptions used in making these estimates, the implied precision, e.g. the difference between .0035 and .0038 is most likely far beyond the actual accuracy of the estimates.

Highly precise quantitative assessment of the relative environmental hazards is not necessary in an evaluation of the relative hazards of the 17 OCS areas. Partially because quantitative assessment was not

Table 114. ESTIMATE OF PLATFORM COLLAPSE AND WELL BLOWOUT (SAFETY VALVE RELIABILITY - 0.96 and 0.99)

	Age of field in years			Remarks
	20	30	40	
Severe Storm Design Standard				
100 yr storm				
Margin of Safety - 1.5	.09/.0036/.0009*	.14/.0056/.0014	.19/.0076/.0019	Average number of times severe storms will cause well blowout
Margin of Safety - 2.0	.04/.0016/.0004	.07/.0028/.0007	.08/.0032/.0008	
200 yr storm				
Margin of Safety - 1.5	.06/.002/.0005	.07/.0028/.0007	.09/.0036/.0009	
Margin of Safety - 2.0	.02/.0008/.0002	.03/.0012/.0003	.04/.0016/.0004	
Earthquake design				
M = 6.6				
Atlantic M_s - 1.5	.25/.01/.0025	.38/.015/.0038	.51/.02/.0051	Average number of times earthquakes will cause well blowout
Atlantic M_s - 2.0	.23/.009/.0023	.35/.014/.0035	.46/.018/.0046	
M = 7.2				
Atlantic M_s - 1.5	.10/.004/.0010	.16/.064/.0016	.21/.008/.0021	
Atlantic M_s - 2.0	.09/.0036/.0009	.14/.056/.0014	.18/.007/.0018	
Gulf of Alaska M_s - 1.5	3.3/.13/.033	4.9/.20/.049	6.5/.26/.065	
Gulf of Alaska M_s - 2.0	2.8/.11/.028	4.2/.168/.042	5.6/.22/.056	
M = 8.6				
Gulf of Alaska - 1.5	.33/.13/.0033	.49/.02/.0049	.65/.026/.0065	
Gulf of Alaska - 2.0	.28/.011/.0028	.42/.019/.0042	.56/.022/.0056	
Combined Severe Storm and Tsunami				
100 yr storm	.001/.00004/.00001	.0015/.00006/.000015	.002/.00008/.00002	
200 yr storm	.0005/.00002/.000005	.0007/.000028/.000007	.001/.00004/.00001	

*(Platform Collapse/Well Blowout R = 0.96/Well Blowout R = 0.99)

Table 115. PROBABILITY OF DAMAGE TO STORAGE SYSTEMS DUE TO NATURAL PHENOMENA

	Age of field in years			Remarks
	20	30	40	
Ashore	0.0	0.0	0.0	Dikes have 100% reliability against damaging oil spill
Afloat				
100 yr storm				
Margin of Safety - 1.5	.095	.14	.19	Average number of times severe storms will cause parting of Floating Storage Moor -
Margin of Safety - 2.0	.044	.066	.088	
200 yr storm				
Margin of Safety - 1.5	.047	.070	.093	
Margin of Safety - 2.0	.022	.033	.044	
Underwater				
100 yr storm				
Margin of Safety - 1.5	.095	.14	.19	Average number of times severe storms will damage or destroy underwater tanks
Margin of Safety - 2.0	.044	.066	.088	
200 yr storm				
Margin of Safety - 1.5	.047	.070	.093	
Margin of Safety - 2.0	.022	.033	.044	
Earthquake				
M = 6.6 Margin of Safety - 2.0				
Atlantic	.23	.35	.46	Average number of times an underwater storage tank will be damaged or destroyed
M = 7.2 Margin of Safety - 2.0				
Atlantic	.09	.14	.18	
Gulf of Alaska	2.8	4.2	5.6	
Tsunami				
Atlantic	.13	.20	.26	Average number of tsunamis having heights greater than 6'
Gulf of Alaska	4	6	8	

Table 116. PROBABILITY OF DAMAGE TO TANKER MOORS DUE TO NATURAL PHENOMENA

	Field Life in Years			Remarks
	20	30	40	
Tankers				
Moored to fixed berth - Valdez	.57	.86	1.1	Average number of times a destructive tsunami will occur in Valdez
Moored to Single Point Moor				
100 yr storm				
Margin of Safety - 2.0	.044	.066	.088	Average number of times severe storms will cause parting of the tanker moor
200 yr storm				
Margin of Safety - 2.0	.022	.033	.044	

necessary and partially because the data necessary to estimate certain of the recurrence relationships were not available, it was decided to evaluate only the relative differences among the environmentally-induced oil spill hazards for the 17 OCS areas. The intent of this relative evaluation was to assign each area to one of four classes, i.e. high hazard, moderately high, moderate or low. Such a classification could be generated in a number of ways. In all such evaluations of relative hazards, knowledge about the environmental conditions in each area is combined with an understanding of how adverse environmental conditions cause accidents to produce the desired rating.

Table 117 presents an evaluation of the relative environmentally-induced oil spill hazards for each OCS area. Each area is presented as a row, and for each area the relative environmental hazards from each environmental variable are identified. This was done primarily by comparing the intensity and frequency of severe events for each natural phenomena. This amounts to rankings by the natural phenomena existing in each area. To represent the differing capacities of the various natural phenomena to produce accidents, a summary column is used. The entries in this summary column are obtained by first noting the mix of environmental conditions in the area (the first 5 columns). Then the combination of OCS development components which

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OCS Area
North Atlanti
Mid-Atlantic
South Atlanti
East Gulf
East Gulf Dee
Central Gulf
Central Gulf
West Gulf
West Gulf Dee
Southern
Southern Cali
Santa Barbara
Santa Barbara
North and Cen
Washington an
Cook Inlet
Gulf of Alask
Southern Aleu
Bristol Bay
Bering Sea Sh
Chukchi Sea
Beaufort Sea

Table 117

Area by Area Summary Evaluation of Relative Oil Spill Hazards Generated by Natural Phenomena

OCS Area	Severe Storms	Earthquakes	Tsunamis	Ice		Summary of the Relative Natural Hazards
				Accretion	Floating	
North Atlantic	Moderately high	Moderate	Low	Moderate	Low	Moderate
Mid-Atlantic	High	Low	Low	Low	Low	Low
South Atlantic	High	Low	Low	Low	Low	Low
East Gulf	High	Low	Low	Low	Low	Low
East Gulf Deep	High	Low	Low	Low	Low	Low
Central Gulf	High	Low	Low	Low	Low	Low
Central Gulf Deep	High	Low	Low	Low	Low	Low
West Gulf	High	Low	Low	Low	Low	Low
West Gulf Deep	High	Low	Low	Low	Low	Moderate
Southern California	Low	Moderately high	Moderate	Low	Low	Moderate
Southern California Deep	Low	Moderately high	Moderate	Low	Low	Moderately high
Santa Barbara	Low	Moderately high	Moderate	Low	Low	Moderate
Santa Barbara Deep	Low	Moderately high	Moderate	Low	Low	Moderately high
North and Central California	Low	Moderate	Moderate	Low	Low	Moderate
Washington and Oregon	Moderate	Low	Moderate	Low	Low	Low
Cook Inlet	Moderate	High	Moderately high	Moderately high	Moderately high	Moderately high
Gulf of Alaska	High	High	High	Moderately high	Moderate	High
Southern Aleutian Shelf	High	High	High	Moderately high	Moderate	High
Bristol Bay	Moderate	Moderate	Moderate	High	Moderately high	Moderately high
Bering Sea Shelf	Moderately high	Low	Low	High	Moderately high	Moderately high
Chukchi Sea	Moderate	Low	Low	High	High	High
Beaufort Sea	Moderate	Low	Low	High	High	High

would minimize the overall environmentally-induced oil spill hazard for that area is selected. This is done by working through Table 113 using the specific environmental parameters for each area. Finally, the relative environmentally-induced oil spill hazard is assessed by noting the vulnerability of this OCS development system to the environmental conditions for the particular area.

Explanation for Table 117

The methods used in preparing Table 117 are sufficiently complex to demand additional explanation. Reading down the columns presents a categorization of the relative intensity of each natural phenomenon across the 17 OCS areas. For example, the severe storms of the North Atlantic are rated moderately high when compared to the severe storms of the Mid-Atlantic which are rated high, and the severe storms of southern California which are rated low.

The ability of the various environmental phenomena to generate accidents differs substantially. Table 113 summarizes these differences. Reading down the columns of Table 113 reveals how serious a threat each natural phenomenon poses to each component in the OCS oil and gas development system. However, as noted in the explanation for Table 113 , the volume of spilled oil per event differs substantially between the component parts of the OCS oil and gas development system. Thus for example the moderately high hazard of floating ice to tankers with 500,000 to 2,000,000 barrels of oil potentially spilled per event may well be more important from an environmental point of view than the serious hazard that floating ice poses to pipelines with only 10,000 barrels of spilled oil at risk per event. Thus it is imperative to define as accurately as possible the components of the OCS oil and gas development system that will be used in each OCS area.

The USGS provided a preliminary identification of the likely components of the OCS oil and gas development systems for each OCS area. This information was used in selecting the appropriate throughput spill rates for Table 111 . With the exception of deep water production areas the petroleum production will be piped to shore for storage or use. This is an assumption and in fact there may be shallow water OCS areas where pipelines will not be used. Similarly, the USGS assumed that all Alaskan petroleum production would be transported by tanker for refining and consumption elsewhere.

This tentative identification of the OCS oil and gas development system components for each OCS area is reflected in Table 117. For example, the deep water production areas in both the Gulf of Mexico and off California are rated as more hazardous then the shallow water production areas in these two regions. The severe storms of the Gulf of Mexico pose only a low hazard to pipelines and platform but these same severe storms pose a much larger hazard to tanker and barge operations. Thus, the deep water production in areas in the Gulf of Mexico are rated as moderately hazardous. Similarly the moderately high seismicity of southern California and Santa Barbara does not pose a serious hazard to platforms and pipelines. However, the moderate hazard of a tsunami poses a substantial hazard to tankers moored at fixed berths. Thus the two deep water areas off California are rated as moderately high hazard areas while the shallow water areas are rated as only moderately hazardous.

With this background it is now possible to explain the reasons for the various entries in the relative natural hazards column of Table 117 .

North Atlantic - Moderate

The moderate seismicity of the area and the history of at least one major slumping of Beaver Bank bottom sediments warrant the moderate

Mid and South Atlantic - Low

The relatively high severe storms of these areas should not pose a large hazard to platforms, but even if they did the volume of potentially spilled oil at risk per event is relatively small

All Gulf of Mexico areas were rated the same way - low for shallow water production and moderate for deep water production. The reason for this has already been explained.

Southern California and Santa Barbara have the same relative assessments of natural phenomena. The moderately high seismicity of these areas combined with the moderate threat of a tsunami resulted in the moderate summary assessment. The deep water production areas off California were rated as moderately high. This was done because of the moderate tsunamis hazard to tankers moored at fixed berths with potential oil spill volumes per event between 500,000 to 2,000,000 barrels.

North and Central California - Moderate

The moderate score for earthquakes and tsunamis were considered sufficiently important to produce the moderate summary assessment in spite of the low score for the other natural phenomena.

Washington and Oregon - Low

The moderate score for severe storms combined with the moderate score for tsunamis was considered to pose a lower hazard than the natural hazards found in either the North Atlantic or northern California.

Cook Inlet - Moderately High

The high score for earthquakes was the lowest level of seismicity for any of the "high" earthquake areas. Added to this is the fact that Cook Inlet oil and gas production fields did survive the Prince William Sound earthquake without severe damage.

Gulf of Alaska and Southern Aleutian Shelf - High

The high score for severe storms, earthquakes and tsunamis combined with moderately high ice accretion make these areas highly hazardous.

Bristol Bay - Moderately High

The high ice accretion, the moderately high relative hazard for floating ice combined with no other relative hazard less than moderate resulted in the moderately high assessment.

Bering Sea Shelf - Moderately High

This area is quite similar to Bristol Bay in terms of natural hazards.

Chukchi and Beaufort Seas - High

The high scores for both ice accretion and floating ice represent serious hazards to OCS operations.

Interpretation of the summary of the relative natural hazards column of Table 117 is difficult. As already explained, subjective judgment played a role in formulation of this table. Furthermore, all the information is relative. This is the key to proper interpretation of this table. The high, moderately high, moderate, and low characterizations of the 22 listed areas with respect to natural hazards presented in this table are relative as between areas. Assigning any absolute interpretation to these relative groupings is incorrect.

D. Major Oil Spills and the Marine Environment

In the minds of most people, the offshore oil and gas industry is associated with Santa Barbara and oil spills. This section starts with a summary of the physical, chemical and biological properties of oil spills. The work done by the Massachusetts Institute of Technology for the Council on Environmental Quality is the primary reference for this discussion (CEQ, 1974). However, oil spills in Arctic waters are substantially different than oil spills in more temperate waters. Therefore, the MIT report is supplemented by references to studies of oil spills in Arctic areas reported in a report prepared by the Battelle Memorial Institute for the U.S. Coast Guard (1974). The second part of this section presents a historical summary of the Santa Barbara oil spill. The purpose of this summary discussion of the Santa Barbara oil spill is to clarify the actual effects of this massive spill. Additionally, discussion of the biological effects of the Santa Barbara oil spill will serve as an introduction to the discussion of the biological impacts associated with the proposal to accelerate OCS oil and gas leasing.

1. Generic Description of the Fate of Spilled Oil

Oil spills can be transported many miles from the site of an accident. How waves passing underneath an oil slick, winds blowing over an oil slick and currents in the underlying water combine to move an oil spill is incompletely understood. Nevertheless, movement of oil spills from the sites of accidents to coastal areas is a prime concern. MIT in their work for CEQ concentrated their efforts on estimating probabilities of OCS oil spills reaching coastal areas. This analysis of oil spill trajectories will be discussed in Section III.E. Our primary concern in this section is how oil spreads from the source of a spill and further on the processes which change the characteristics of the oil as it weathers.

Consider now a large volume of oil suddenly released on the surface of the sea. Presume that there are no physical boundaries restricting the spread of this oil in horizontal directions. Under these conditions, which are appropriate for OCS oil spills, the spreading of the oil will occur at different rates as the time from the spill increases. The details of the various forces affecting these spreading rates are beyond the scope of this discussion. Readers interested in these details are referred to the Georges Bank Petroleum Study, Volume II, Massachusetts Institute of Technology, Report No. MITSG 73-5, February 1, 1973. For this discussion, it is sufficient to report the results of the MIT analysis. Figure 85 is taken from the MIT report and it shows the following areas of oil spreading for various sized oil spills: 1,000 gallons spill, 11.8 acres in slightly over one hour; 10,000

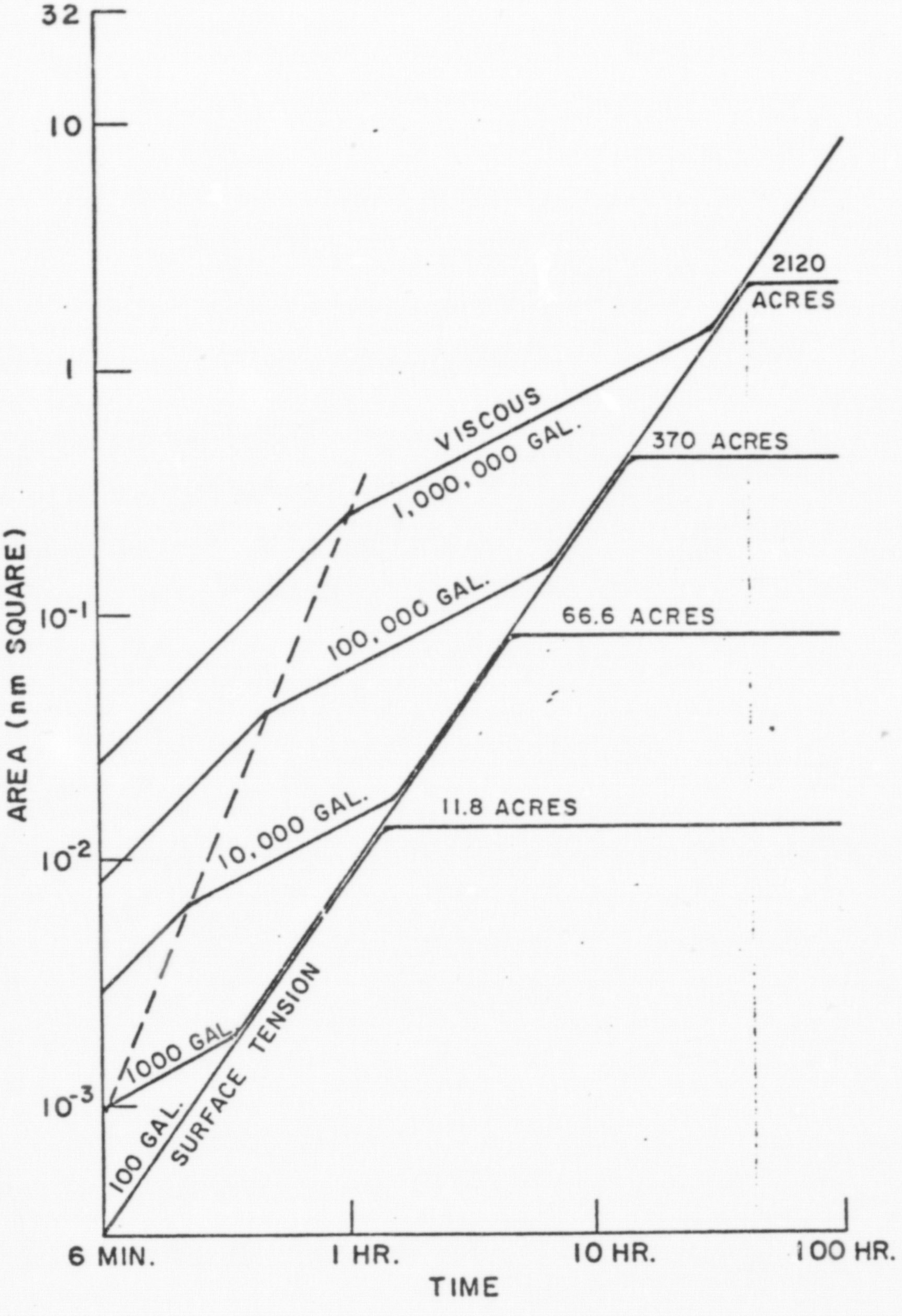


FIGURE 85 REPRESENTATIVE SPREADING HISTORIES FOR FIVE SPILL VOLUMES, AREA COVERED VS. TIME FROM SPILL

TYPICAL CRUDE OIL CHARACTERISTICS

gallon spill, 66.6 acres in approximately seven hours; 100,000 gallon spill, 370 acres in slightly over 10 hours; and 1,000,000 gallon spill, 2,120 acres in approximately 75 hours. These areas of spread are for one spill continuing as one spreading mass. At some time in the spreading process, variations in the winds, waves and currents usually cause a large continuous spill to break up into several large patches surrounded by many smaller patches. As time goes on, the large patches will separate from one another. This will increase the width of the path swept by the spill. Apparently such processes were at work on the Santa Barbara oil spill. An oil slick spread over approximately a thousand square miles extending from northwest of Santa Barbara to Ventura and Oxnard on the South and offshore beyond the Channel Islands.

Petroleum in seawater is altered chemically by evaporation, dissolution, chemical oxidation, photochemical reactions and microbial action. These processes are often referred to collectively as weathering. How fast crude oil weathers is influenced by the properties of the crude oil as well as light, temperature, winds, waves and currents. All of these factors affect the rates of evaporation, dissolution, dispersal and sedimentation processes. Additionally, the nutrient content of the water can affect the rate of microbial degradation. Weathering rates also vary for the various components in a crude oil. The more volatile aromatic fractions tend to evaporate rapidly. Certain fractions, usually the heavier ones, do not weather and these may be deposited in sediments or they may float as tar lumps or tar balls. Oil and its breakdown products may remain in sediments indeterminately until they are churned up by turbulence to recontaminate a recovering area.

The persistence of crude oil in the differing marine environments of the various OCS areas may vary considerably. Most observations of oil spills are for temperate areas and little is known about the properties of crude oil in the chilled waters of the Alaskan areas. The viscosity of crude oil increases at lower temperatures and in frigid Arctic waters many crudes may spread very slowly if at all. Microbial degradation will also be slower in Arctic waters because the oil is more viscous perhaps forming thick films or clumps which are harder for the bacteria to attack. Further, the low temperature slows the metabolism of the attacking bacteria. In addition, limited winter daylight reduces photochemical oxidation of oil spills in the more northern areas. Oil exposed to the very low temperatures of the Arctic winters may sink. Any oil contaminating bottom sediments in the Alaskan areas is expected to be more persistent than oil in the sediments of more temperate areas.

2. The Santa Barbara Oil Spill

The conditions which lead to the blowout of well A-21 on platform A in the Santa Barbara Channel were discussed in a previous section. This discussion focuses on the biological effects of this massive oil spill. The factual material for this discussion was taken primarily from the excellent discussion of the Santa Barbara oil spill contained in a lengthy comment received from the Southern California Council of Local Governments. 1/ This discussion presented here is limited to the environmental impacts of the Santa Barbara oil spill.

It is virtually impossible to assess the total and long-term damage to the Santa Barbara Channel ecosystem which occurred as a result of the spill. One primary reason for this difficulty is the fact that adequate baseline information is not available. This lack of a detailed ecological description for the affected area prior to the oil spill makes it difficult to be certain that the ecosystem has recovered to pre-spill conditions. Nevertheless, at least one scientist noted that the number of marine organisms appeared to be roughly comparable to pre-spill populations and concluded that the spill's effect on marine life was negligible. (Straughan, 1971).

1/ Analysis of Draft Environmental Impact Statement Regarding "Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf," presented on behalf of the Southern California Council of Local Governments, by Tom Bradley, Mayor, City of Los Angeles, Burt Pines, City Attorney, City of Los Angeles, Undated.

This controversy about the long-term damage to the marine ecosystem aside, the short-term effects were considerable. Foster (1974) estimated the number of organisms killed and the amount of biomass removed as a result of oil pollution and oil cleanup activities.

Habitat and Organisms	
Rocky Intertidal Zone	
Barnacles	8,770,000 killed
Surf grass	16 tons of blades and attached algae and invertebrates removed
Polychaete worms	80,900 killed
Limpets	51,800 killed
High Intertidal	
Crevice fauna (mostly arthropods)	20,000 killed
Mussels	30,000 killed
Sandy Beaches	
Sandy Beach macrofauna	15,000,000 removed during beach cleanup
Deep Subtidal Zone	
Benthic invertebrates	6,000 tons lost
Neritic Habitat	
Marine Birds	9,000 killed (60% loons and grebes)

Marine bird losses are the most dramatic example of the environmental consequences of the Santa Barbara oil spill. Oil coated birds usually die. Even in treatment centers, mortality rates of 90 percent and higher have occurred. Oil coating disrupts the water repellent properties of the feathers, causing the birds to become waterlogged and sink. Also, the insulating properties of the feathers are destroyed by oil coating causing loss of body heat. When the birds attempt to clean their feathers, they ingest oil which can become an additional cause of mortality.

The damage listed by Foster which occurred to other organisms was less dramatic. The organisms in the rocky intertidal zones which were killed by the oil spill died primarily from the smothering effect of the oil. Sandblasting and steamcleaning of the rocks to remove the oil stains undoubtedly killed many intertidal and splash zone organisms such as periwinkle, limpets, mussels, pill bugs, etc. Approximately 60 percent of the mussels killed in Santa Barbara harbor were killed as a result of steamcleaning.

Sandy beach microfauna, which includes sand hoppers, sand crabs, bloodworms and many additional species, were killed primarily as a result of sand removal during beach cleanup operations. Shallow subtidal organisms, which include giant kelp, other plants and invertebrates apparently suffered only minor impacts.

The long term effects of the Santa Barbara oil spill are difficult to estimate and there is some disagreement among scientists. Foster (1974) concludes:

> "The continued presence of oil from the initial spill on solid substrata and in sandy beaches, the observed changes in deep subtidal benthic communities, and the fact that oil continues to escape from the platform, all suggest that the Channel has not recovered."

Straughan (1971) concluded that the spill's effect on marine life was negligible. With minor exceptions, the area impacted by the Santa Barbara oil spill has for all practical purposes returned to its pre-spill condition.

The fact that the massive Santa Barbara oil spill apparently has not resulted in major long-term impacts on the Santa Barbara Channel ecosystem should not be used to conclude that massive oil spills in other areas under different circumstances will also result in negligible impacts. What the above discussion points out is that perceptions of the Santa Barbara oil spill as a catastrophe which permanently destroyed or altered environmental conditions of the area are not factually valid.

E. Proximity Analysis

Now that the potential sources of environmental contamination have been identified (for the different phases of operations), annual discharges of oil have been estimated for all OCS regions based on historical throughput spill rates, and the degrees of hazard to OCS operations caused by natural phenomena have been identified, the next critical parameter in the analysis of impacts, proximity, is addressed. In terms of public consciousness, the single most devastating possible occurrence related to OCS operations is the massive oil spill, especially large amounts of relatively fresh crude oil reaching the shoreline. Consequently, the proximity analysis is directed at this possibility and the types of coastal resources that could be affected. This is not to diminish the possible impacts of spilled oil at sea or the possible ecosystem-wide impacts of chronic low-level discharges. The scientific community, while disagreeing about current levels of contamination due to chronic discharges, generally agrees that the effects of these discharges are unknown but that the potential for long-term damage must be recognized. Spills at sea may clearly have detrimental effects that are not amenable to proximity analysis. These revolve around potential impacts to adult schooling fish and to pelagic eggs and larvae of important finfish and shellfish. While severe impacts have been sustained by the ichthyoplankton in certain past spills, predictions that such effects will occur are nearly impossible to make. Proximity analysis is nearly meaningless for planktonic or migratory organisms, except for broad geographic areas that harbor important species having planktonic stages in their life cycles.

Proximity can also be measured to significant offshore bottom features, such as coral reefs and fishing banks. Identification of these features is the purview of a site-specific impact statement, not a programmatic statement. Protective stipulations have been applied to these types of structures in earlier site-specific impact statements (OCS Sale #34 and 37).

Proximity analysis begins with the following set of questions:

Where can one expect oil to originate?

How long will it take to reach shore?

Where will it come ashore, probabilistically?

What will be the severity of the impact on coastal resources?

The only readily differentiable origins of large oil spills from area to area on the OCS are the hypothetical drilling locations. Other origins are not amenable to analysis. For instance, where oil is piped to shore, pipeline ruptures could occur at any point between the field and the shore. Thus, all areas have essentially the same vulnerability to spills from pipelines. Where pipelines are long because the oil fields are far from shore, pipeline spills have a greater probability of occurring farther from shore. Consequently, the differentiable factor of the hypothetical drilling locations also addresses to some degree the potential impacts of pipeline rupturing.

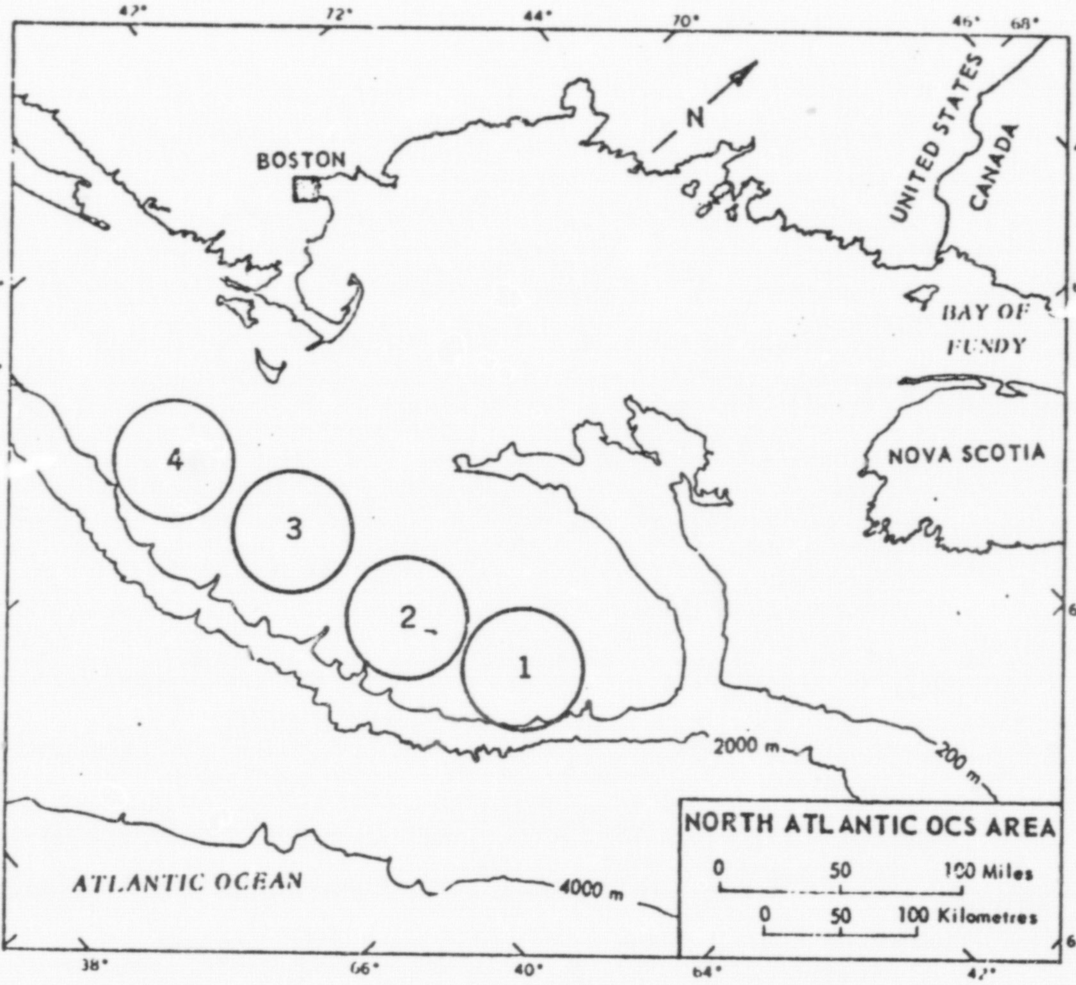
Oil field production may be transported to market via tankers or tank barges in some areas, either because of ice conditions, tract depth, or oil field isolation from other fields and shore. Surface transportation is more hazardous than pipeline transportation, but the variables of destination (out of area, to an underwater storage location, to an onshore storage location, or to a nearby port or refinery) make analysis of this potential source of oil spillage difficult at best, meaningless at worst. Anticipated transportation modes for all OCS areas were indicated in an earlier portion of this section on spillage rates.

The USGS supplied BLM with maps indicating 74 hypothetical drilling sites on the entire OCS where development has a high probability of occurring. These hypothetical drilling sites are portrayed in Figures 86 through 103.

Table 118 following the maps indicates those elements of proximity analysis that allow an overall categorization of the various OCS areas in terms of potential hazard from a large oil spill. The table is subsequently explained regarding method of analysis and significance of results. Additional information was added based on the MIT analysis performed for CEQ in its OCS Oil and Gas - An Environmental Assessment, which looked only at the Atlantic coast and Gulf of Alaska areas.

72°
40°
70°
38°
68°

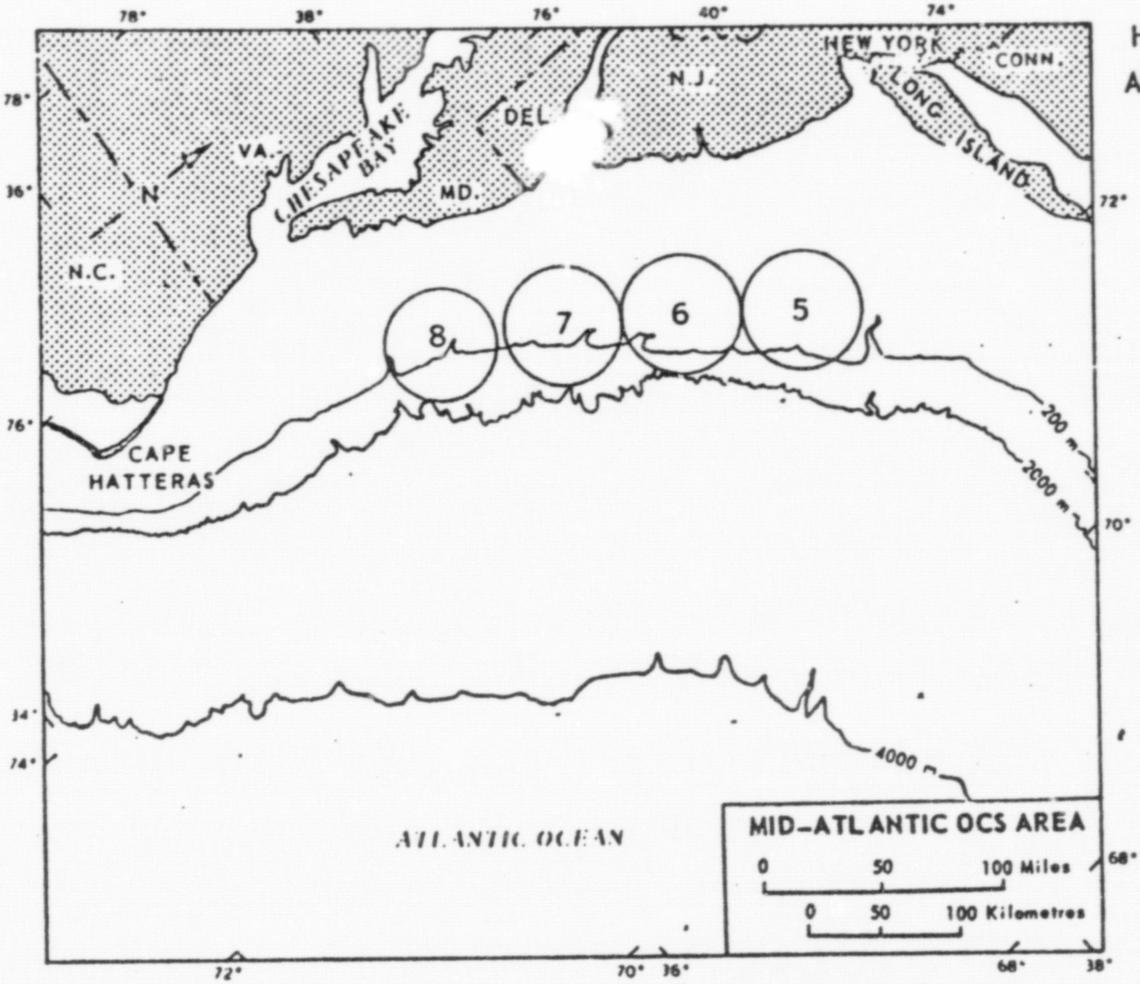
Fi


42°
72°
44°
70°
46°
68°
N
BOSTON
UNITED STATES
CANADA
46°
72°
66°
BAY OF FUNDY
40°
NOVA SCOTIA
4
3
2
1
70°
64°
2000 m
200 m
NORTH ATLANTIC OCS AREA
0 50 100 Miles
0 50 100 Kilometres
38°
ATLANTIC OCEAN
4000 m
68°
62°
38°
66°
40°
64°
42°

HYPOTHETICAL DRILLING SITES IN ACCELERATED OCS LEASING PROGRAM

①	41° 10′ N	66° 50′ W
②	40° 50′ N	67° 50′ W
③	40° 40′ N	69° 00′ W
④	40° 25′ N	70° 00′ W

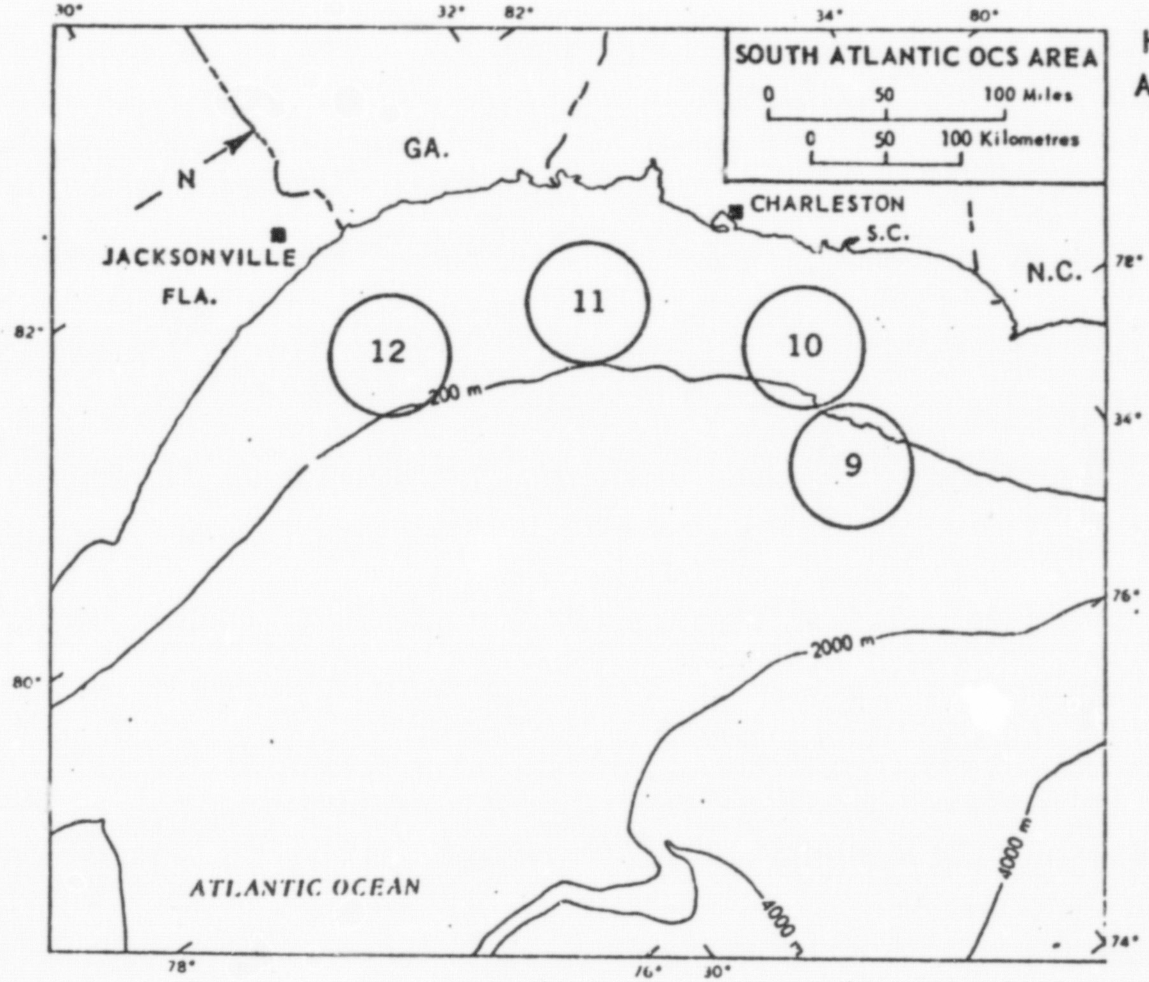
Figure 86.


78°
38°
76°
40°
74°
78°
36°
76°
34°
74°
72°
70°
68°
72°
70°
36°
68°
38°
NEW YORK
CONN.
N.J.
LONG ISLAND
DEL.
MD.
VA.
CHESAPEAKE BAY
N
N.C.
CAPE HATTERAS
8
7
6
5
200 m
2000 m
4000 m
ATLANTIC OCEAN
MID-ATLANTIC OCS AREA
0
50
100 Miles
0
50
100 Kilometres

HYPOTHETICAL DRILLING SITES IN ACCELERATED OCS LEASING PROGRAM

⑤	39° 15′N	72° 50′W
⑥	38° 35′N	73° 25′W
⑦	38° 00′N	74° 00′W
⑧	37° 20′N	74° 30′W

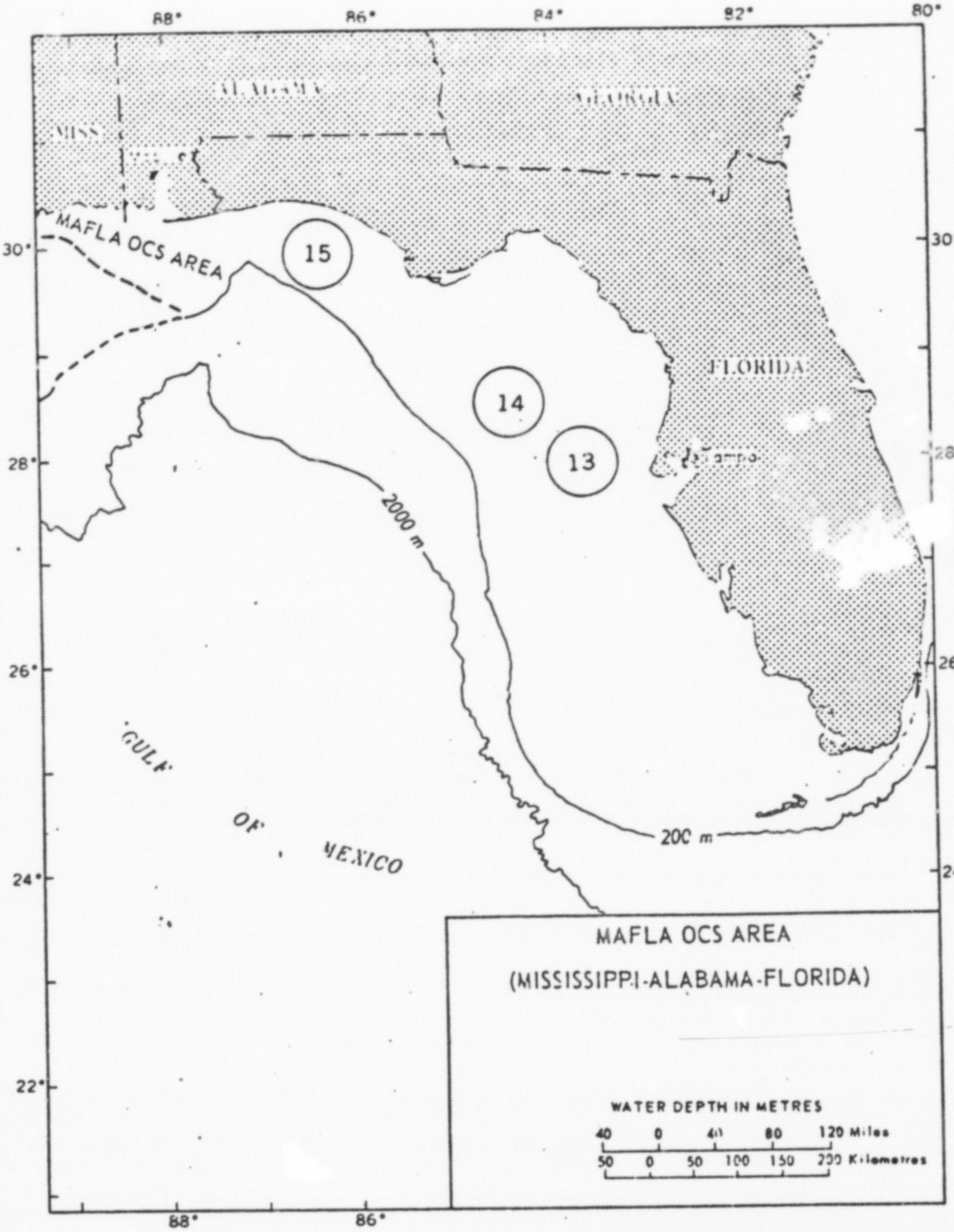
Figure 87


SOUTH ATLANTIC OCS AREA
0 50 100 Miles
0 50 100 Kilometres
GA.
N
JACKSONVILLE FLA.
CHARLESTON S.C.
N.C.
9
10
11
12
200 m
2000 m
4000 m
ATLANTIC OCEAN
30°
32°
82°
34°
80°
78°
76°
74°

HYPOTHETICAL DRILLING SITES IN ACCELERATED OCS LEASING PROGRAM

⑨	32° 30′ N 77° 55′ W
⑩	32° 40′ N 78° 50′ W
⑪	31° 30′ N 80° 00′ W
⑫	30° 30′ N 80° 30′ W

Figure 88


88°
86°
84°
82°
80°
ALABAMA
GEORGIA
MISS.
MAFLA OCS AREA
30°
15
14
13
FLORIDA
Tampa
28°
2000 m
26°
GULF OF MEXICO
200 m
24°
22°
MAFLA OCS AREA
(MISSISSIPPI-ALABAMA-FLORIDA)
WATER DEPTH IN METRES
40 0 40 80 120 Miles
50 0 50 100 150 200 Kilometres
88°
86°

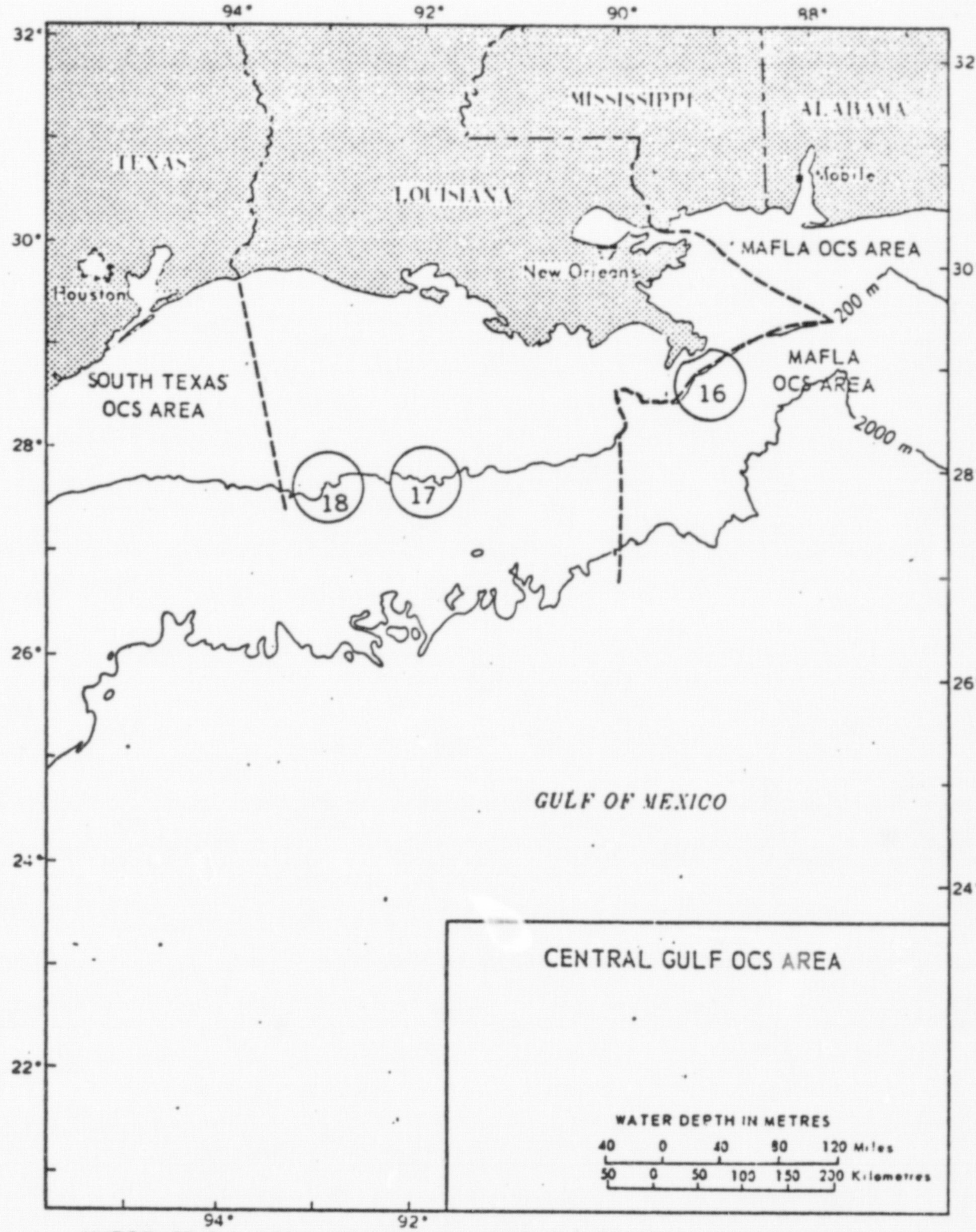
HYPOTHETICAL DRILLING SITES IN ACCELERATED OCS LEASING PROGRAM

Figure 89.

⑬ 27° 55′ N 83° 40′ W

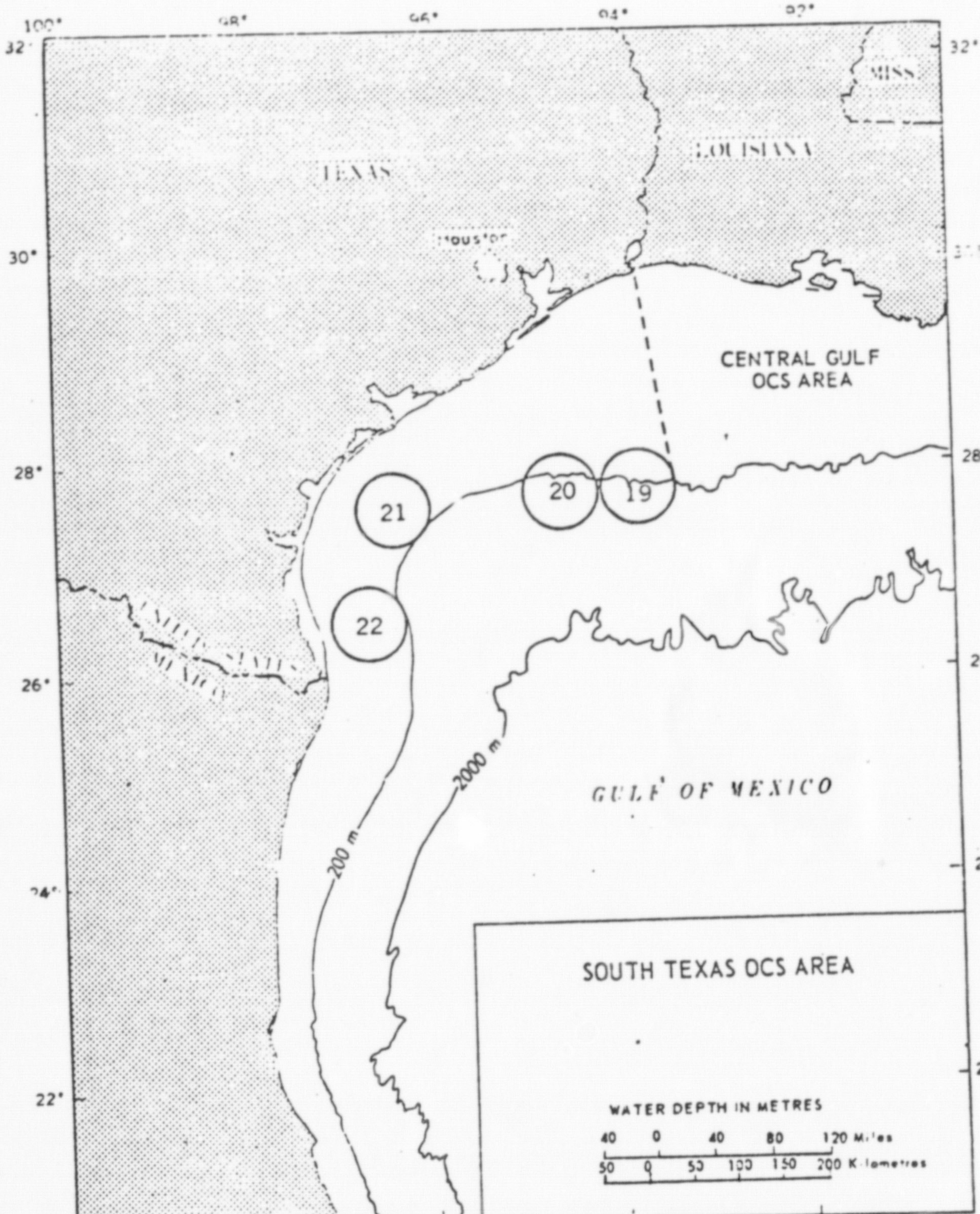
⑭ 28° 30′ N 84° 25′ W

⑮ 29° 55′ N 86° 25′ W


94°
92°
90°
88°
32°
30°
28°
26°
24°
22°
TEXAS
LOUISIANA
MISSISSIPPI
ALABAMA
Mobile
Houston
New Orleans
MAFLA OCS AREA
200 m
MAFLA OCS AREA
16
SOUTH TEXAS OCS AREA
2000 m
18
17
GULF OF MEXICO
CENTRAL GULF OCS AREA
WATER DEPTH IN METRES
40 0 40 80 120 Miles
50 0 50 100 150 200 Kilometres

HYPOTHETICAL DRILLING SITES IN ACCELERATED OCS LEASING PROGRAM

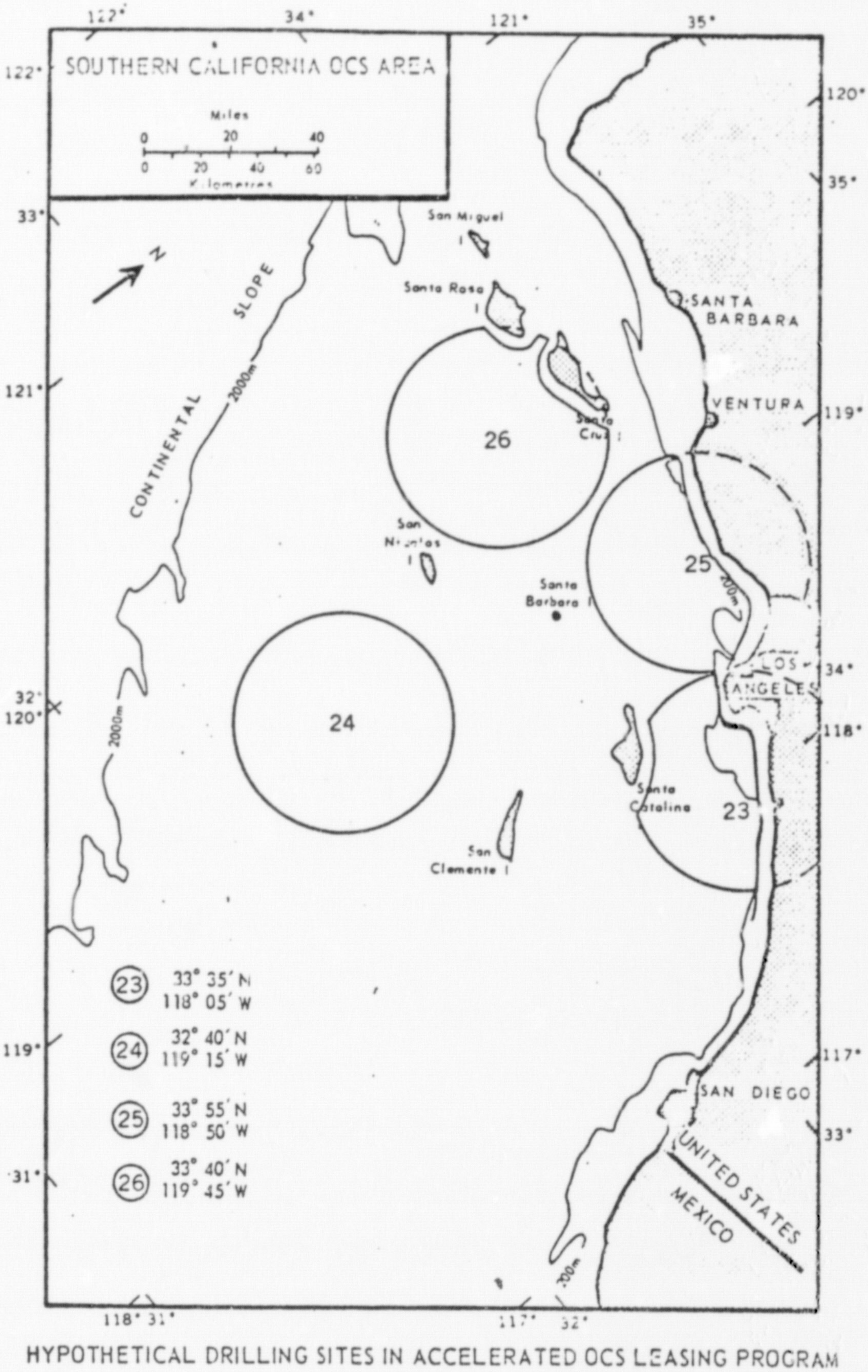
Figure 90. ⑯ 28° 45′ N 89° 00′ W ⑰ 27° 50′ N 92° 00′ W ⑱ 27° 45′ N 93° 00′ W


100°
98°
96°
94°
92°
32°
30°
28°
26°
24°
22°
MISS.
LOUISIANA
TEXAS
HOUSTON
CENTRAL GULF
OCS AREA
21
20
19
22
UNITED STATES
MEXICO
2000 m
200 m
GULF OF MEXICO
SOUTH TEXAS OCS AREA
WATER DEPTH IN METRES
40 0 40 80 120 Miles
50 0 50 100 150 200 Kilometres

HYPOTHETICAL DRILLING SITES IN ACCELERATED OCS LEASING PROGRAM

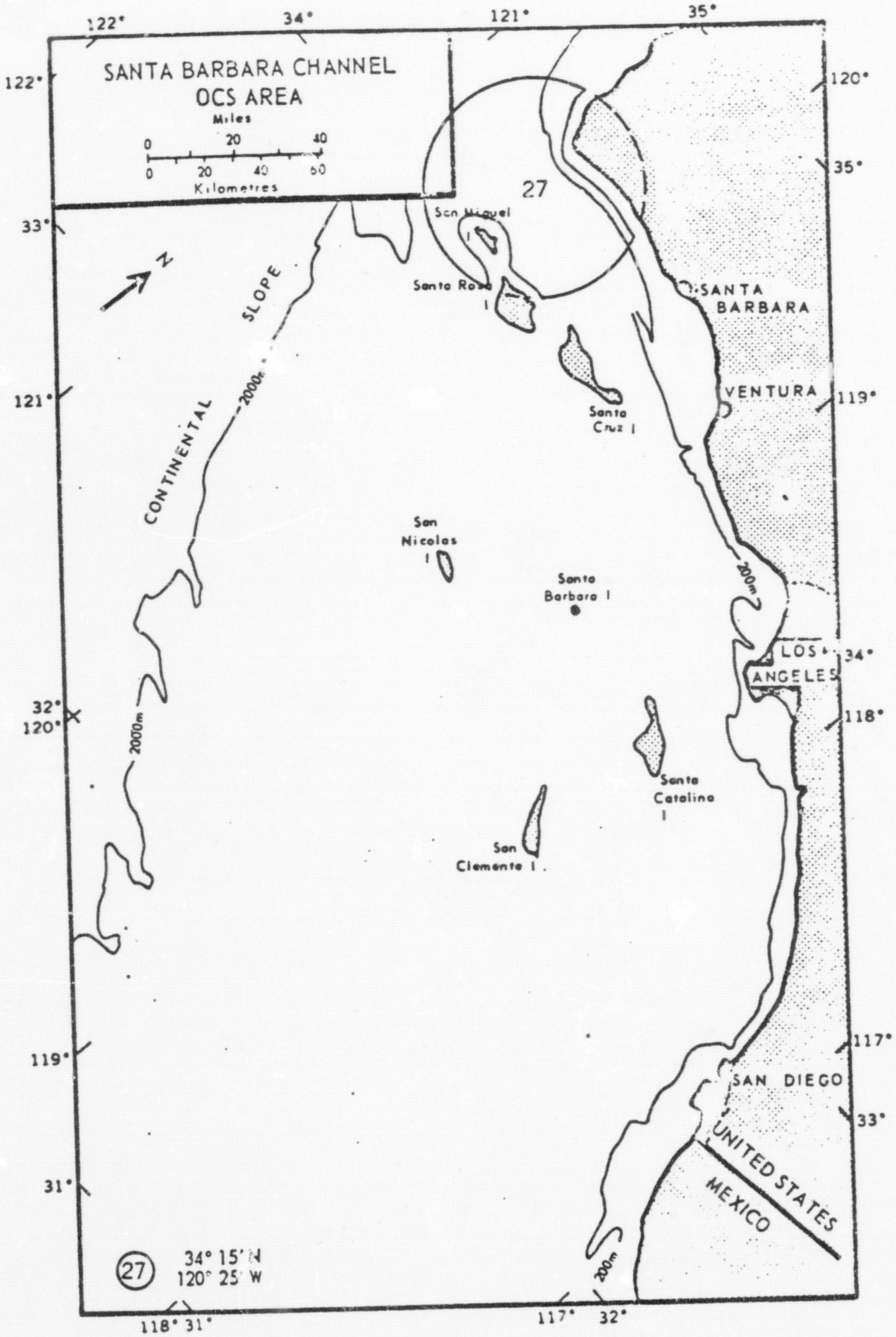
Figure 91.

⑲	27° 45′ N 93° 50′ W	⑳	27° 45′ N 94° 35′ W
㉑	27° 35′ N 96° 25′ W	㉒	26° 30′ N 96° 40′ W


SOUTHERN CALIFORNIA OCS AREA
Miles
0 20 40
0 20 40 60
Kilometres
N
CONTINENTAL SLOPE
2000m
San Miguel I
Santa Rosa I
Santa Cruz I
San Nicolas I
Santa Barbara I
Santa Catalina
San Clemente I
SANTA BARBARA
VENTURA
LOS ANGELES
SAN DIEGO
UNITED STATES
MEXICO
200m
26
25
24
23
122°
34°
121°
35°
120°
33°
119°
32°
118°
31°
117°
(23) 33° 35′ N 118° 05′ W
(24) 32° 40′ N 119° 15′ W
(25) 33° 55′ N 118° 50′ W
(26) 33° 40′ N 119° 45′ W

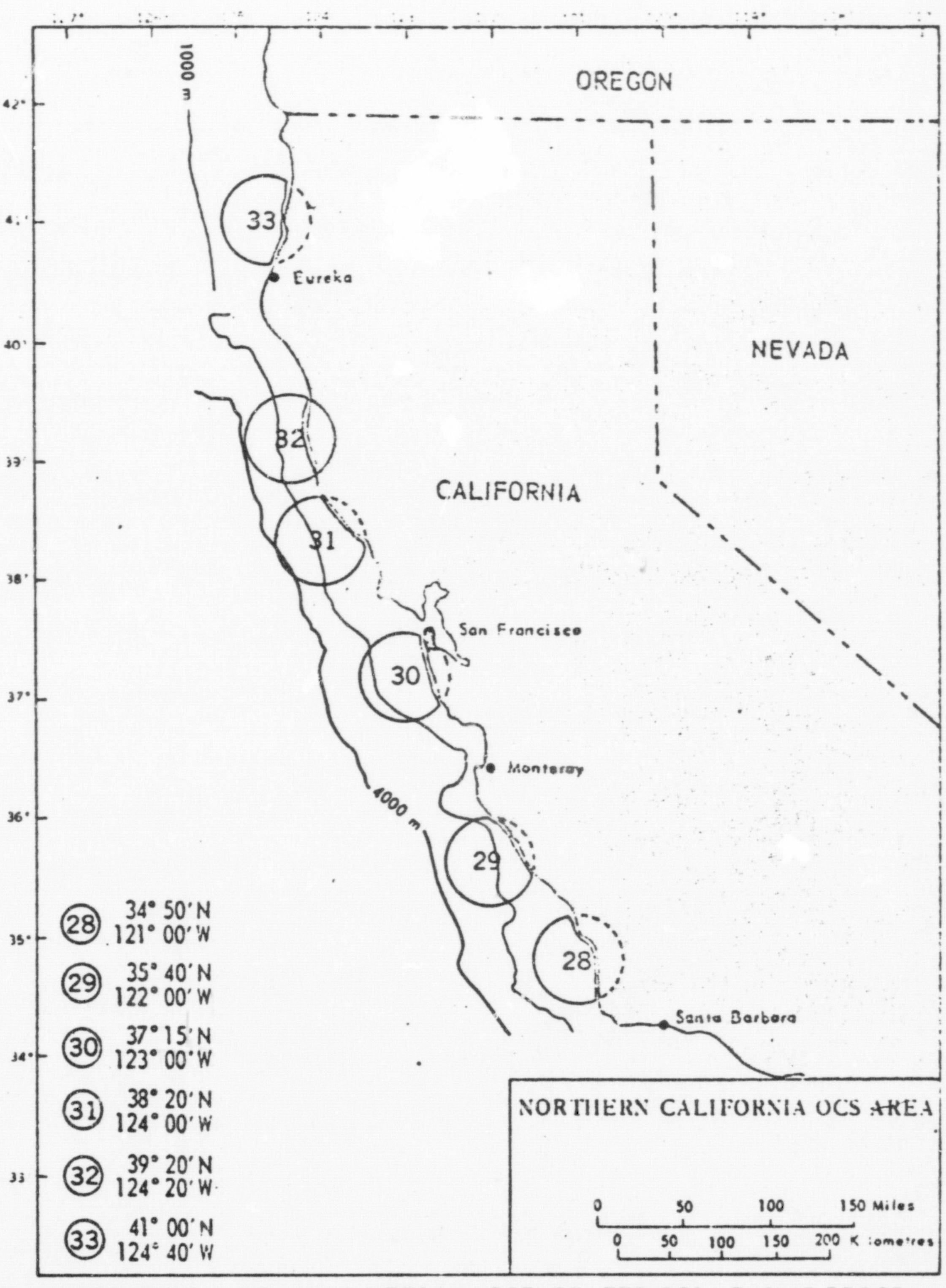
HYPOTHETICAL DRILLING SITES IN ACCELERATED OCS LEASING PROGRAM

Figure 92.


122°
34°
121°
35°
122°
120°
SANTA BARBARA CHANNEL
OCS AREA
Miles
0
20
40
0
20
40
60
Kilometres
35°
27
San Miguel
I
33°
N
Santa Rosa
I
SANTA
BARBARA
CONTINENTAL
SLOPE
2000m
121°
VENTURA
119°
Santa
Cruz I
San
Nicolas
I
Santa
Barbara I
200m
LOS
ANGELES
34°
32°
120°
2000m
118°
Santa
Catalina
I
San
Clemente I
117°
119°
SAN DIEGO
33°
UNITED STATES
MEXICO
31°
27
34° 15′ N
120° 25′ W
200m
118° 31°
117° 32°

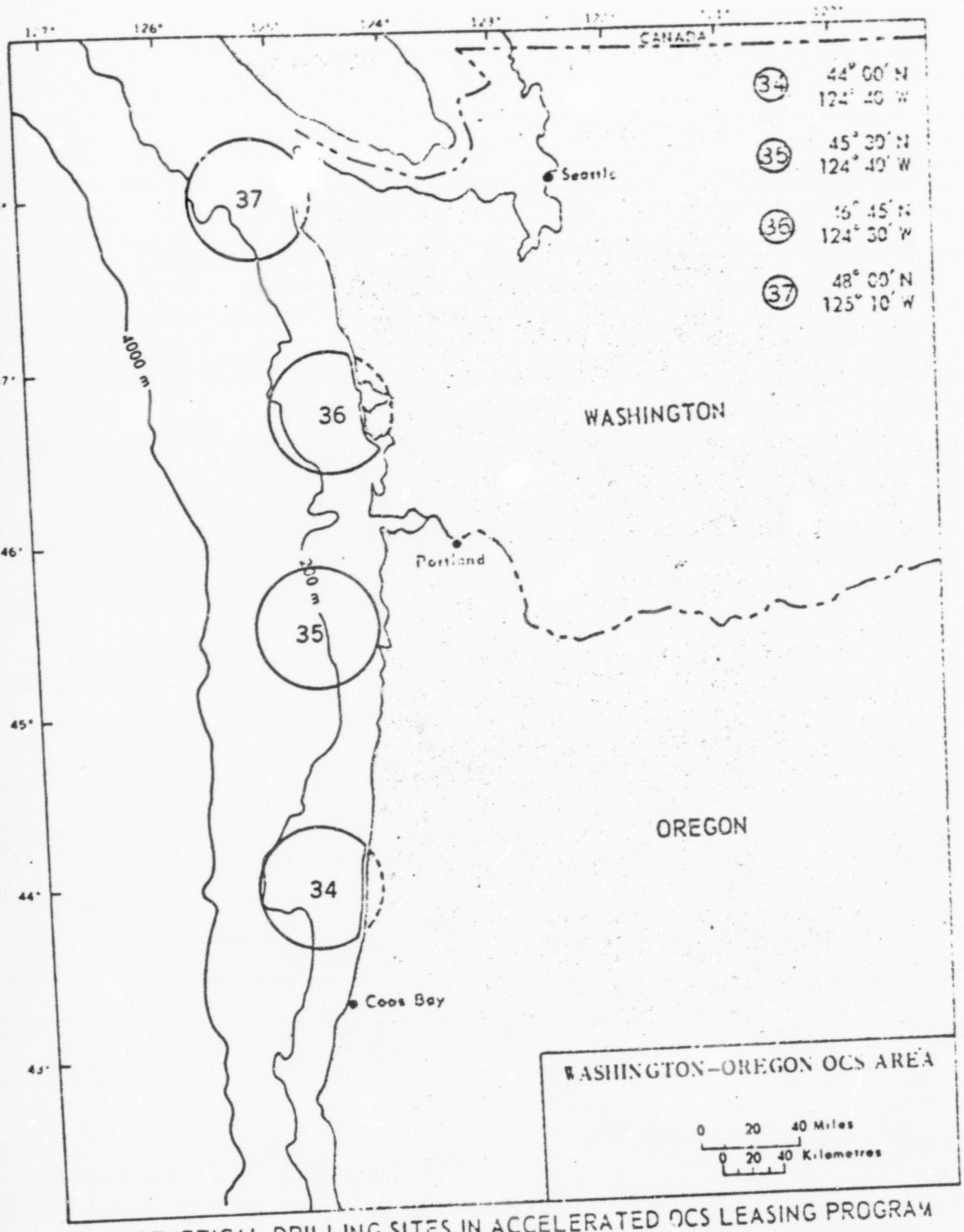
HYPOTHETICAL DRILLING SITE IN ACCELERATED OCS LEASING PROGRAM

Figure 93.


OREGON
NEVADA
CALIFORNIA
1000 m
4000 m
Eureka
San Francisco
Monterey
Santa Barbara
33
32
31
30
29
28
42°
41°
40°
39°
38°
37°
36°
35°
34°
33
(28) 34° 50′N 121° 00′W
(29) 35° 40′N 122° 00′W
(30) 37° 15′N 123° 00′W
(31) 38° 20′N 124° 00′W
(32) 39° 20′N 124° 20′W
(33) 41° 00′N 124° 40′W
NORTHERN CALIFORNIA OCS AREA
0 50 100 150 Miles
0 50 100 150 200 Kilometres

HYPOTHETICAL DRILLING SITES IN ACCELERATED OCS LEASING PROGRAM

Figure 94.


127°
126°
125°
124°
123°
122°
121°
120°
48°
47°
46°
45°
44°
43°
CANADA
Seattle
Portland
Coos Bay
WASHINGTON
OREGON
4000 m
200 m
37
36
35
34
(34) 44° 00′ N 124° 40′ W
(35) 45° 30′ N 124° 40′ W
(36) 46° 45′ N 124° 30′ W
(37) 48° 00′ N 125° 10′ W
WASHINGTON–OREGON OCS AREA
0 20 40 Miles
0 20 40 Kilometres

HYPOTHETICAL DRILLING SITES IN ACCELERATED OCS LEASING PROGRAM

Figure 95.

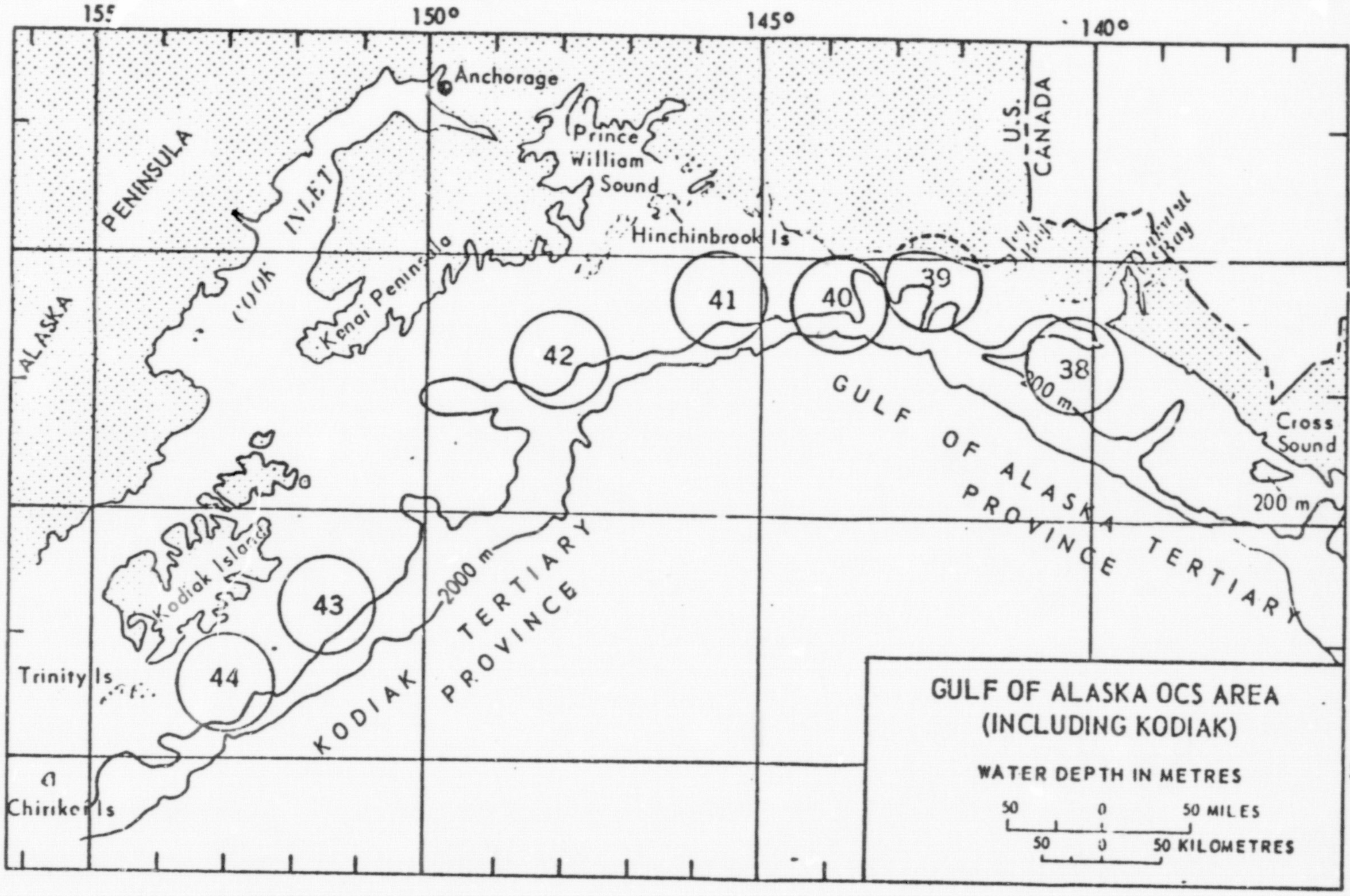

155
150°
145°
140°
60°
58°
56°
Anchorage
Prince William Sound
Hinchinbrook Is
U.S.
CANADA
ALASKA
PENINSULA
COOK INLET
Kenai Peninsula
Icy Bay
Yakutat Bay
Cross Sound
Kodiak Island
Trinity Is
Chirikof Is
38
39
40
41
42
43
44
200 m
2000 m
GULF OF ALASKA TERTIARY PROVINCE
KODIAK TERTIARY PROVINCE
GULF OF ALASKA OCS AREA
(INCLUDING KODIAK)
WATER DEPTH IN METRES
50 0 50 MILES
50 0 50 KILOMETRES

Figure 96. HYPOTHETICAL DRILLING SITES IN ACCELERATED OCS LEASING PROGRAM

㊳	59° 10'N	140° 15'W
㊴	59° 50'N	142° 25'W
㊵	59° 40'N	143° 50'W
㊶	59° 40'N	145° 40'W
㊷	59° 15'N	148° 00'W
㊸	57° 15'N	151° 30'W
㊹	56° 35'N	153° 00'W

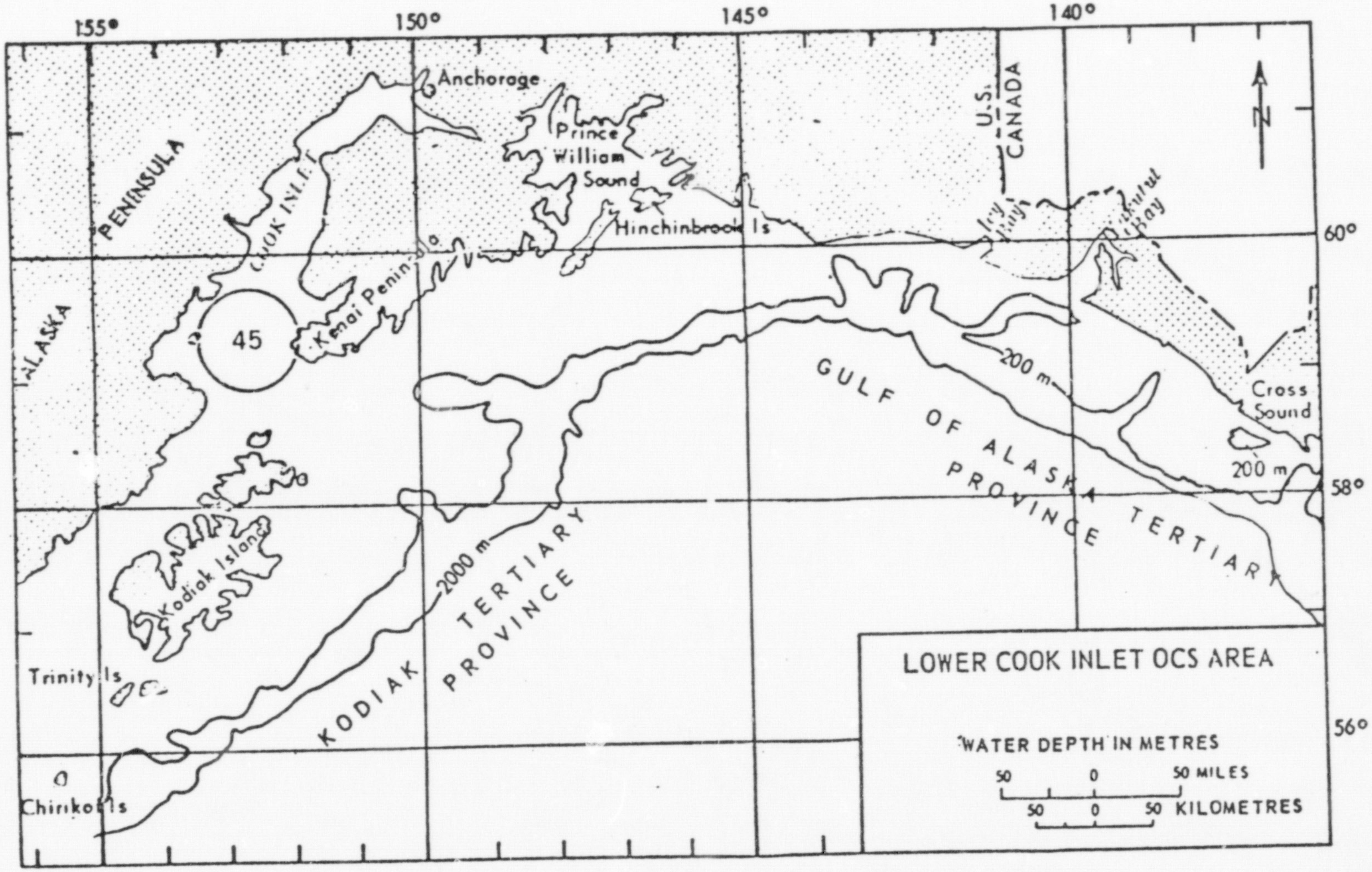

155°
150°
145°
140°
60°
58°
56°
Anchorage
Prince William Sound
Hinchinbrook Is
U.S.
CANADA
N
ALASKA
PENINSULA
COOK INLET
Kenai Peninsula
45
Yakutat Bay
Cross Sound
200 m
200 m
2000 m
GULF OF ALASKA TERTIARY PROVINCE
KODIAK TERTIARY PROVINCE
Kodiak Island
Trinity Is
Chirikof Is
LOWER COOK INLET OCS AREA
WATER DEPTH IN METRES
50 0 50 MILES
50 0 50 KILOMETRES

Figure 97. HYPOTHETICAL DRILLING SITE IN ACCELERATED OCS LEASING PROGRAM

(45) 59° 20′ N 152° 40′ W

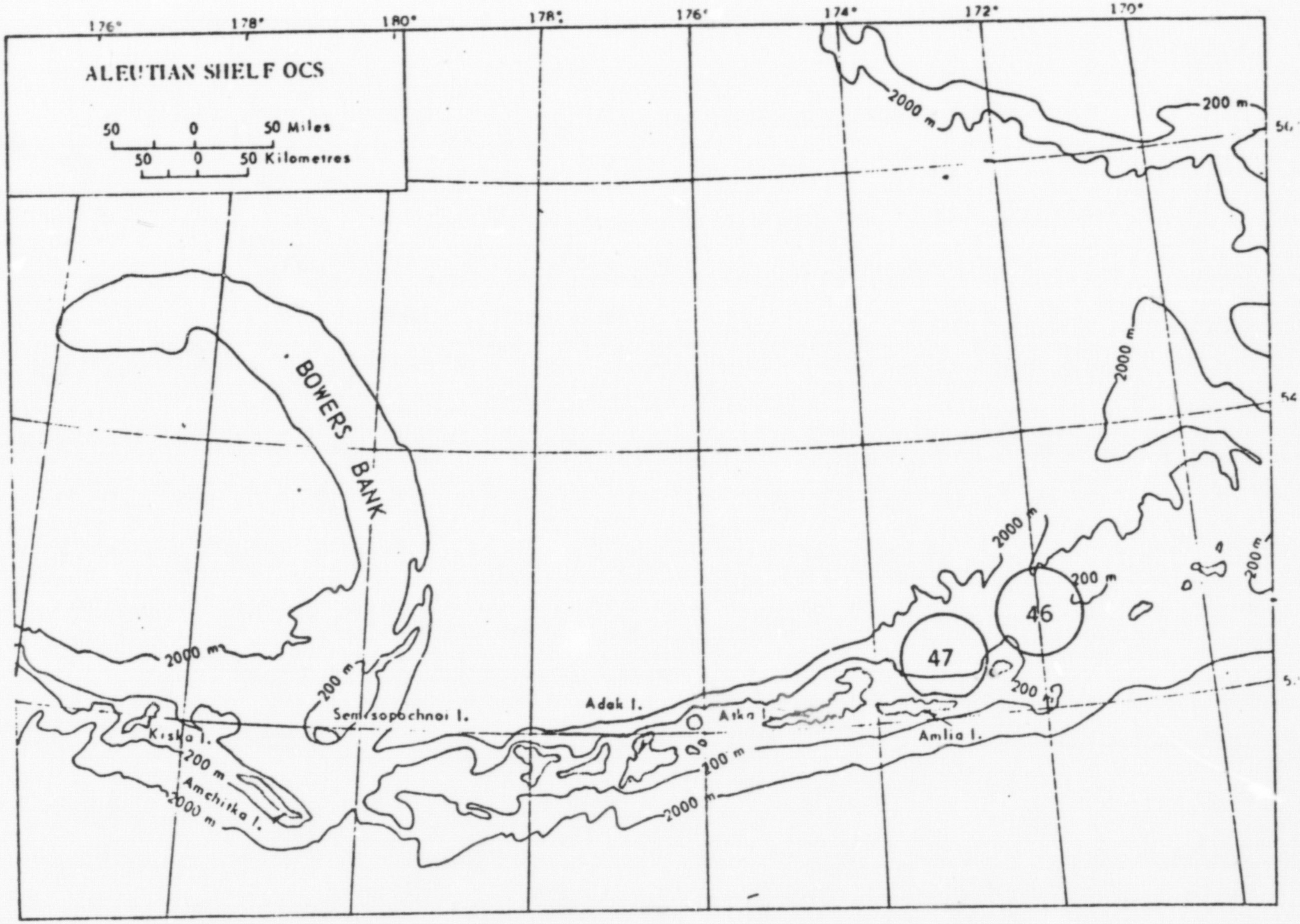
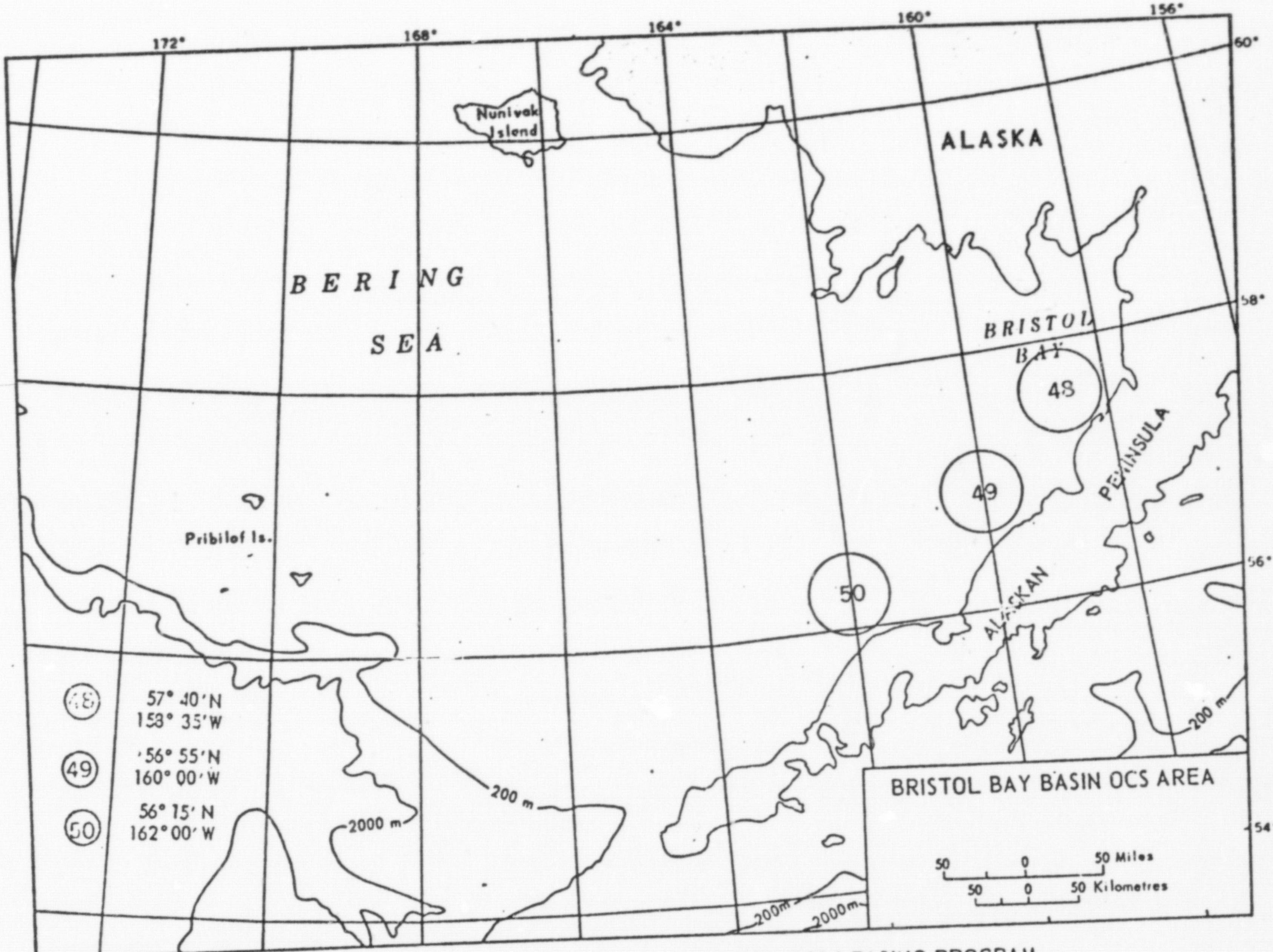

176°
178°
180°
178°
176°
174°
172°
170°
ALEUTIAN SHELF OCS
50 0 50 Miles
50 0 50 Kilometres
BOWERS BANK
2000 m
200 m
Semisopochnoi I.
Adak I.
Atka I.
Amlia I.
Kiska I.
Amchitka I.
46
47

Figure 98. HYPOTHETICAL DRILLING SITES IN ACCELERATED OCS LEASING PROGRAM

㊻ 52° 40′ N
172° 00′ W

㊼ 52° 25′ N
173° 10′ W


172°
168°
164°
160°
156°
60°
58°
56°
54°
Nunivak Island
ALASKA
BERING SEA
BRISTOL BAY
PENINSULA
ALASKAN
Pribilof Is.
48
49
50
200 m
2000 m
BRISTOL BAY BASIN OCS AREA
50 0 50 Miles
50 0 50 Kilometres
48 57° 40′ N 158° 35′ W
49 56° 55′ N 160° 00′ W
50 56° 15′ N 162° 00′ W

HYPOTHETICAL DRILLING SITES IN ACCELERATED OCS LEASING PROGRAM

Figure 99.

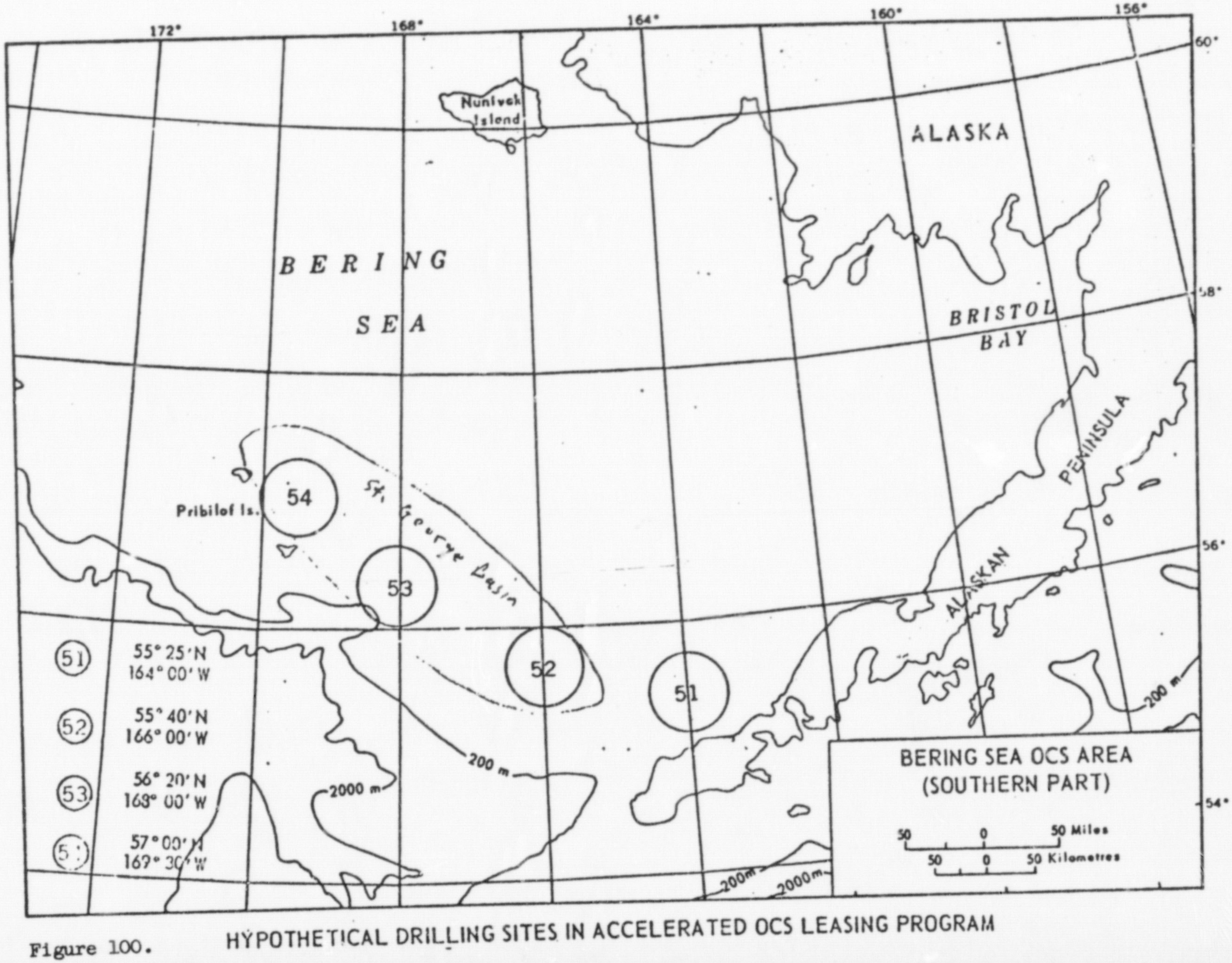

172°
168°
164°
160°
156°
60°
58°
56°
54°
Nunivak Island
ALASKA
BERING SEA
BRISTOL BAY
ALASKAN PENINSULA
Pribilof Is.
St. George Basin
54
53
52
51
200 m
2000 m
51 55° 25' N 164° 00' W
52 55° 40' N 166° 00' W
53 56° 20' N 168° 00' W
54 57° 00' N 169° 30' W
BERING SEA OCS AREA (SOUTHERN PART)
50 0 50 Miles
50 0 50 Kilometres

Figure 100. HYPOTHETICAL DRILLING SITES IN ACCELERATED OCS LEASING PROGRAM

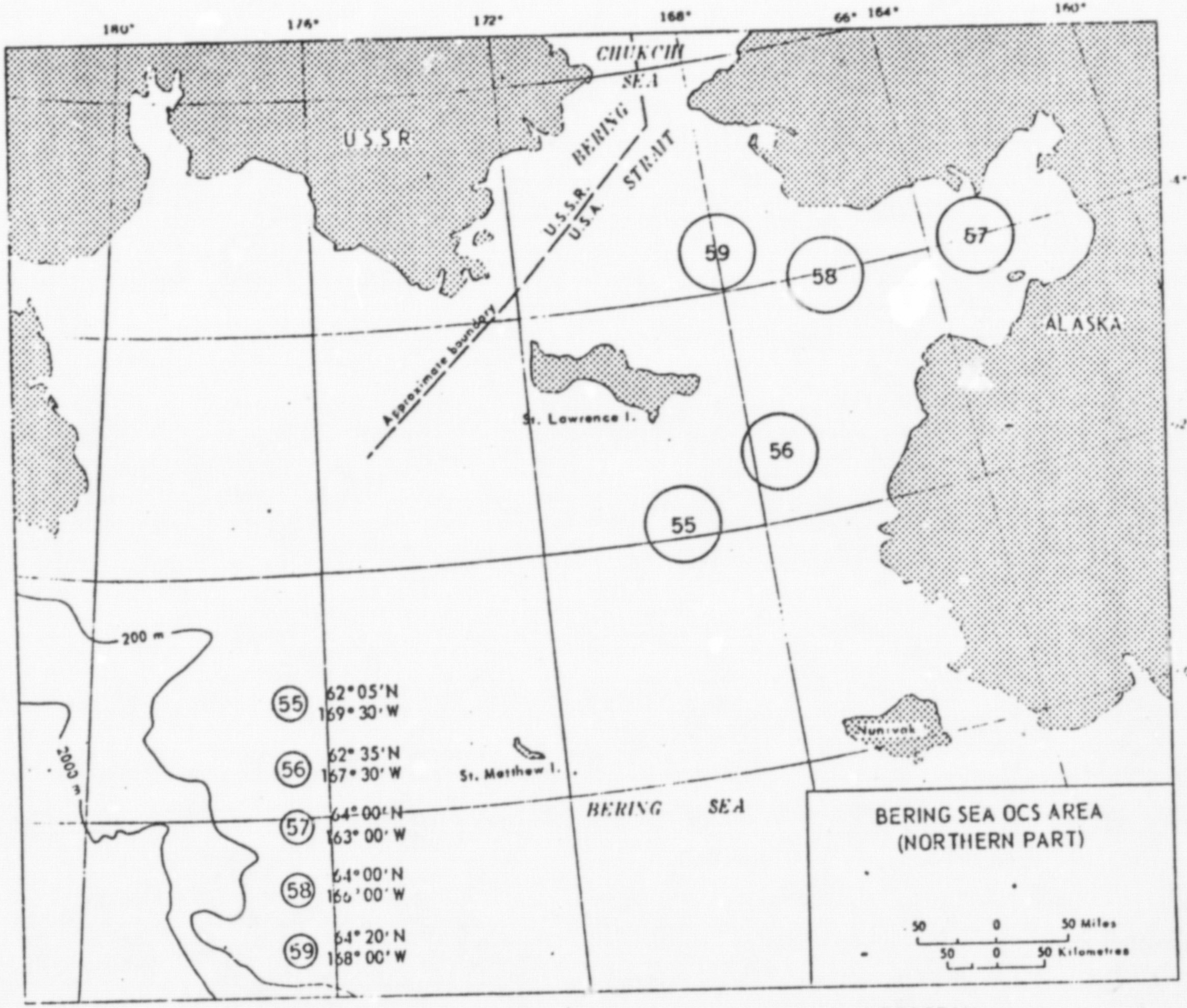
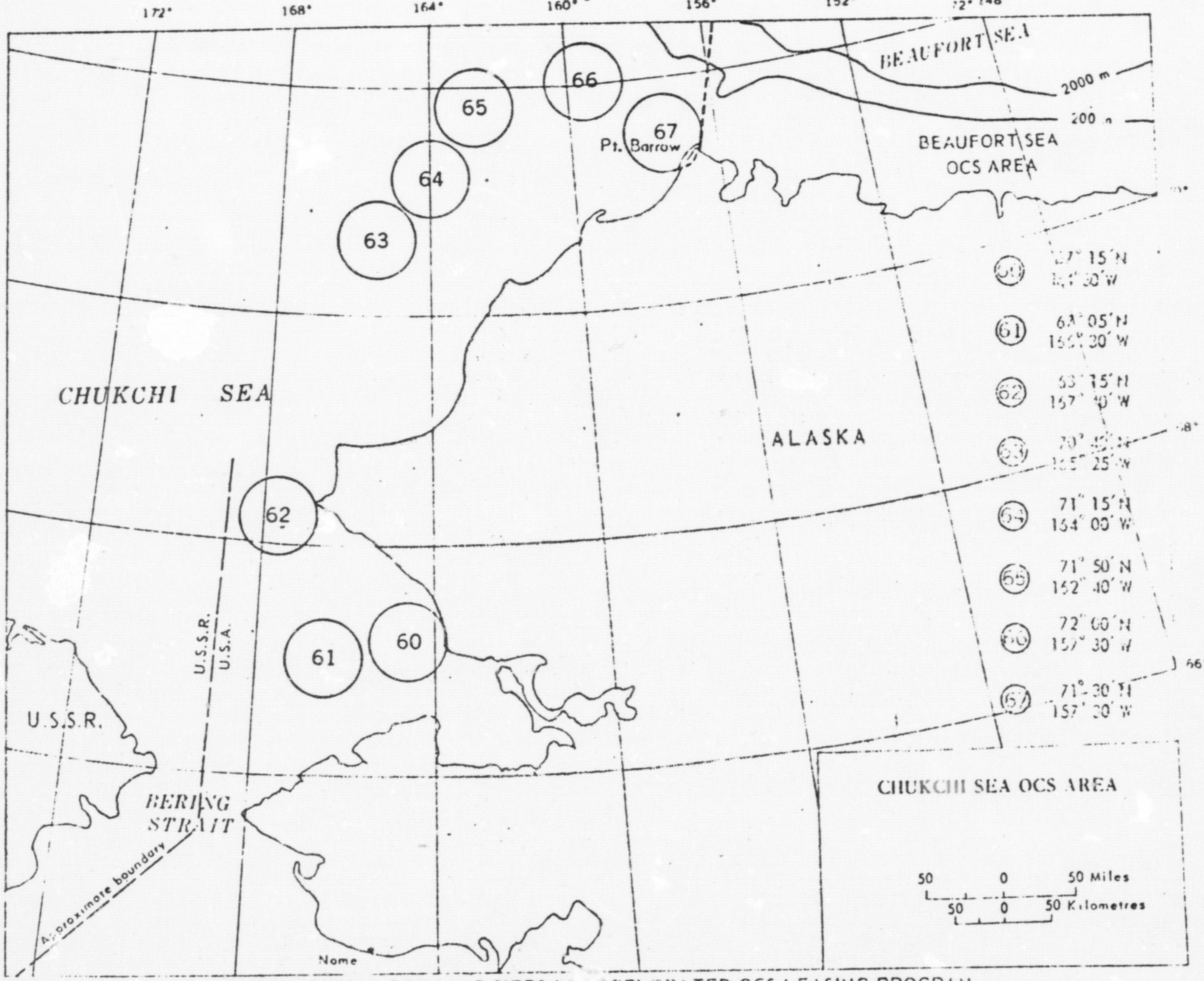

180°
176°
172°
168°
164°
160°
CHUKCHI SEA
U.S.S.R.
BERING STRAIT
U.S.S.R.
U.S.A.
Approximate boundary
St. Lawrence I.
ALASKA
59
58
57
56
55
Nunivak
St. Matthew I.
BERING SEA
200 m
2000 m
55 62° 05'N 169° 30' W
56 62° 35'N 167° 30' W
57 64° 00'N 163° 00' W
58 64° 00'N 166° 00' W
59 64° 20'N 168° 00' W
BERING SEA OCS AREA (NORTHERN PART)
50 0 50 Miles
50 0 50 Kilometres

Figure 101. HYPOTHETICAL DRILLING SITES IN ACCELERATED OCS LEASING PROGRAM



172°
168°
164°
160°
156°
152°
148°
72°
68°
66°
BEAUFORT SEA
2000 m
200 m
BEAUFORT SEA OCS AREA
Pt. Barrow
CHUKCHI SEA
ALASKA
U.S.S.R.
U.S.S.R.
U.S.A.
BERING STRAIT
Approximate boundary
Nome
60
61
62
63
64
65
66
67
60 67° 15' N [illegible] 30' W
61 68° 05' N 16[illegible] 30' W
62 [illegible] 15' N 167° [illegible]0' W
63 70° [illegible] N 165° 25' W
64 71° 15' N 164° 00' W
65 71° 50' N 162° 40' W
66 72° 00' N 157° 30' W
67 71° 30' N 157° 30' W
CHUKCHI SEA OCS AREA
50 0 50 Miles
50 0 50 Kilometres

Figure 102. HYPOTHETICAL DRILLING SITES IN ACCELERATED OCS LEASING PROGRAM

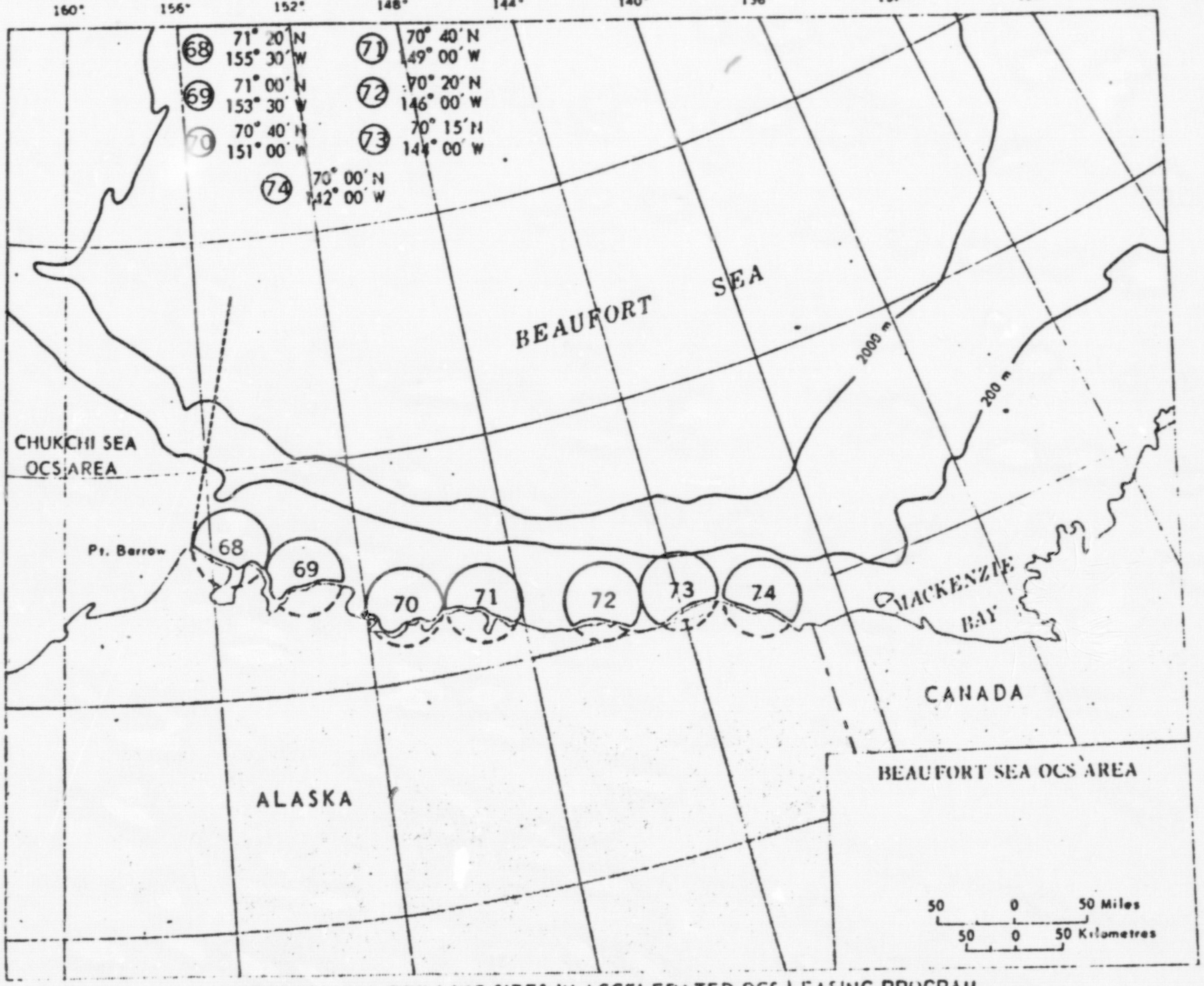

160°
156°
152°
148°
144°
140°
136°
132°
128°
74°
72°
70°
68 71° 20′ N 155° 30′ W
69 71° 00′ N 153° 30′ W
70 70° 40′ N 151° 00′ W
71 70° 40′ N 149° 00′ W
72 70° 20′ N 146° 00′ W
73 70° 15′ N 144° 00′ W
74 70° 00′ N 142° 00′ W
BEAUFORT SEA
2000 m
200 m
CHUKCHI SEA OCS AREA
Pt. Barrow
68
69
70
71
72
73
74
MACKENZIE BAY
CANADA
ALASKA
BEAUFORT SEA OCS AREA
50 0 50 Miles
50 0 50 Kilometres

Figure 103. HYPOTHETICAL DRILLING SITES IN ACCELERATED OCS LEASING PROGRAM

Table 118. Proximity Analysis for Hypothetical Drilling Sites (HDS)

HDS #	Distance to Coast	Probable Landfall	Resources at Landfall	CEQ Prob.	Time to Landfall	Severity
1	160(130)	Nantucket (+Shoals)	Beaches, boating, fishing	15-0	60-*	Minimal
2	120(90)	Nantucket (+Shoals)	Beaches, boating, fishing	20-0	50-*	Minimal
3	65(35)	Nantucket (+Shoals)	Beaches, boating, fishing	30-5	35-*	Minimal
4	53(25)	Nantucket (+Shoals)	Beaches, boating, fishing	35-5	30-*	Minimal
5	75(48)	Long Island, North Jersey	Beaches, fishing, commerce	15-0	80-*	Minimal
6	70(40)	Cape May, South Jersey	Beaches, fishing	15-0	80-*	Minimal
7	65(35)	Maryland eastern shore	Beaches, marshes, fishing	10-0	70-*	Minimal
8	58(30)	Va. - N.C. border	Beaches, fishing, boating	5-0	60-*	Minimal
9	88(60)	Charleston	Beaches, marshes, commerce	20-0	40-*	Minimal
10	40(19)	Charleston	Beaches, marshes, commerce	95-0	10-30	Moderate-High
11	52(23)	Savannah	Beaches, marshes, commerce	100-5	21-50	Moderate
12	54(25)	Jacksonville	Beaches, boating, fishing	60-10	21-50	Moderate
13	50(28)	Florida Bend	Marshes, fishing		10-40	Minimal
14	95(75)	Florida Bend	Marshes, fishing		30-60	Minimal
15	33(12)	Florida Panhandle	Barrier beaches boating		2-20	Moderate-High
16	25(3)	Miss. River delta	Marshes, commerce		hrs.-days	High
17	112(90)	Texas-La. border	Beaches, boating, fishing		30-*	Minimal
18	135(110)	Texas-La. border	Beaches, boating, fishing		35-*	Minimal
19	130(105)	Padre Island	Barrier beach		50-*	Minimal
20	100(75)	Padre Island	Barrier beach		50-*	Minimal
21	50(25)	Corpus Christi	Barrier beach, boating, fishing		10-50	Moderate
22	40(15)	Brownsville	Barrier beach		10-50	Moderate
23	3(3)	Corona-L.A.	Beaches, boating, kelp beds		hrs.-days	High
24	40(15)	San Nicholas I. and Santa Barbara I.	Boating, mammals, beaches		2-40	Moderate
25	5(3)	Santa Monica-Ventura	Boating, beaches		hrs.-days	High
26	10(3)	Santa Rosa I.-Santa Cruz I.	Boating, beaches		hrs.-days	High
27	10(3)	Point Concepcion, Channel	Boating, beaches		hrs.-days	High
28	10(3)	Coast north of Point Concepcion	Beaches, fishing		hrs.-days	High
29	20(3)	Big Sur and South	Rocky coast, fishing		hrs.-days	High
30	20(3)	San Francisco Bay	Beaches, boating, commerce		hrs.-days	High

Table 118 (cont') **Proximity Analysis for Hypothetical Drilling Sites (HDS)**

HDS #	Distance to Coast	Probable Landfall	Resources at Landfall	CEQ Prob.	Time to Landfall	Severity
31	20(3)	Pt. Reyes Nat. Seashore	Beaches		hrs.-days	High
32	15(3)	Pt. Arena	Beaches		hrs.-days	High
33	10(3)	Orich area	Beaches		hrs.-days	High
34	17(3)	Winchester Bay, Westlake	Pocket beaches		2-12	High-Moderate
35	25(3)	Garibaldi, Rockaway	Pocket beaches		2-20	High-Moderate
36	13(3)	Grays Harbor, Willapa Bay	Continuous and pocket beaches		2-10	High
37	19(3)	Olympic Nat. Park Coast	Pocket beaches		2-12	High-Moderate
38	30(3)	Yakutat	Beaches, fishing	95-40	hrs-20	High
39	17(3)	Cape St. Ehas	Beaches, fishing	100-75	hrs-10	High
40	25(3)	C. St. Ehas, Katalla	Beaches, fishing	100-55	hrs-15	High
41	43(25)	Hinchinbrook and Montague Is.	Rocky coast, fishing	100-55	5-30	High-Moderate
42	40(22)	Kenai Peninsula Coast	Rocky coast, fishing	100-60	5-30	High-Moderate
43	35(17)	Kodiak Island	Rocky coast, fishing	5-0	3-25	Moderate-Minimal
44	27(9)	Kodiak Island	Rocky coast, fishing	10-0	3-25	Moderate-Minimal
45	18(3)	Kenai and Alaskan Peninsulas	Pocket beaches, fishing, commerce		hrs-5	High
46	38(20)	Sequam-Amukta Is.	Beaches, fishing		hrs-*	Moderate
47	25(7)	Amlia Island	Beaches, fishing		hrs-*	Moderate
48	27(9)	Pilot Point	Beaches, fishing		—	—
49	33(15)	Port Heidin	Beaches, fishing		—	—
50	30(12)	Port Moller	Beaches, fishing		—	—
51	30(12)	Unimak I.	Beaches, fishing		5-25	Moderate
52	90(70)	Unknown	—		—	—
53	100(75)	Pribilof Is.	Birds, mammals		50-*	Minimal
54	30(12)	Pribilof Is.	Birds, mammals		5-*	Moderate
55	75(55)	St. Lawrence I.	Sandy beach, fishing		40-*	Minimal
56	75(55)	St. Lawrence I. or Mainland	Beaches, fishing		40-*	Minimal
57	25(5)	Norton Sound	Beaches, fishing		1-20	High
58	40(20)	Nome	Beaches, commerce		20-40	Minimal
59	62(45)	Unknown	—		—	—
60	25(3)	Kotzebue Bay	Beaches, fishing		hrs-30	High-Moderate
61	60(42)	Kotzebue Bay	Beaches, fishing		30-80	Minimal
62	25(3)	Point Hope	Pocket beaches		hrs-days	High-Moderate
63	85(65)				—	—
64	90(70)				—	—
65	110(90)				—	—
66	85(65)				—	—

Table 118 (cont') Proximity Analysis for Hypothetical Drilling Sites (HDS)

HDS #	Distance to Coast	Probable Landfall	Resources at Landfall	CEQ Prob.	Time to Landfall	Severity
67	20(3)	Pt. Barrow	Beaches, fishing		hrs-days	High
68	15(3)	Pt. Barrow	Beaches, fishing		hrs-days	High
69	15(3)	Smith Bay	Beaches, fishing		hrs-days	High
70	15(3)	Harrison Bay	Beaches, fishing		hrs-days	High
71	15(3)	Prudhoe Bay	Beaches, O&G drilling		hrs-days	High
72	15(3)	Coast	Beaches, fishing		hrs-days	High
73	15(3)	Coast	Beaches, fishing		hrs-days	High
74	15(3)	Martin Point	Beaches, fishing		hrs-days	High

Explanation of Table 118

The first column in the table indicates the straight-line distance in miles to the nearest coastal feature from the center of the hypothetical drilling site. The number in parentheses is the straight line distance in miles to the same feature from the nearest edge of the hypothetical drilling site. The nearest coastal feature may not be the probable landfall, but the data is presented here to indicate the minimum distance from the probable operations areas to the coastal features.

The second column in the table indicates the probable landfall of a major oil spill. These probable landfalls, as well as the number in the third column, Time To Landfall, were obtained by assessing the average wind and current conditions from the hypothetical drilling site to the shore. Currents are caused by a variety of factors, including wind stress, density differences (geostrophic flow), and tides. However, currents, even surface currents, apparently have less influence on oil slick movement than do winds. Oil slick movement in response to wind stress is generally taken to be 3% of the wind speed. While average annual conditions were used for this part of the analysis, there are generally ranges of conditions that could spell the difference between an oil spill coming ashore quickly or never coming ashore at all, as well as extending the area of possible landfall. Additionally, the range of average expected conditions does not take into account the extraordinary events such as hurricanes; however, hurricanes would tend to break up an oil spill.

The third column indicates the major resources in the area of probable landfall that could be affected by a massive oil spill. Types of resources include beaches, fishing (sport and commercial), boating, marshlands, and commerce (tourism and shipping). The values of selected resources are portrayed and highlighted in a subsequent section of this chapter; thses resources are then used in the summary characterizations of the impacts of development in each OCS area.

The fourth column includes those figures presented in the CEQ report on OCS oil and gas development concerning probabilities of oil spills reaching shore from different areas. Many of the hypothetical drilling sites used by CEQ coincide with the sites provided by the USGS for this impact statement, and thus the MIT analysis performed for CEQ should hold for this presentation. The first figure is the probability (in %) of an oil spill reaching shore during the worst (in terms of driving oil toward the coast) season. The second figure is the probability during the "best" season. The CEQ report focused only on the Atlantic and Gulf of Alaska; hence the blanks in the table.

The fifth column contains the range of anticipated times to landfalls in days from the hypothetical drilling locations. In some cases, shorter transit times are indicated due to very close proximity to shore. The first number in the column is the shortest anticipated transit time under average conditions, while the second number is the longest anticipated transit time. Where substantial probability exists, either because of large distance from shore or because of prevailing offshore winds, that an oil spill might not reach shore, an * is used as the second number. Again, extraordinary events were not included in this analysis.

The next column indicates the probability that spilled oil will reach shore as reported by MIT in the CEQ report (1974). The CEQ report only addressed the Atlantic coast and Gulf of Alaska areas, thus the blanks in this column for other areas. The extensive analysis performed by MIT to reach these figures was not performed by BLM. The ranges reported area based on seasons of high (first figure) and low (second figure) probability of oil reaching shore from the hypothetical drilling locations.

The last column is a qualitative assessment of the severity of impact on coastal resources that can be anticipated. These characterizations are based on several factors. First, the time the oil spends at sea determines to a great extent its potential impact on coastal resources. Time effects on oil at sea include evaporation of volatiles, physical dispersion, emulsification, dissolution, and microbial degradation. All these effects generally increase in time, and tend to diminish the adverse effects of the spill on the coastal resources. This does not imply that there are no effects; evaporation of volatiles affects air quality, water dispersion and dissolution introduce contaminants to the water and its biota. The impacts being addressed are coastal; it is these potential impacts that are diminished the longer the oil stays at sea.

The second factor that was used in the severity characterization was the probability of oil coming ashore. A lower characterization of severity was applied where offshore winds and associated currents occurred for a significant portion of the year. Since the single characterization is thus an average value for the year, it must be noted that it is possible for spills to come ashore, even though the severity is described as minimal.

The assumptions used in this analysis are as follows:

1) For estimates of probable landfall and time to landfall, an oil spill was considered a coherent entity which

remained so (i.e., no spreading, thinning, weathering, etc.). For severity characterization, however, time of travel and sea state (and thus dispersion, weathering, etc.) were considered.

2) A sizable spill was assumed.

3) Possible clean-up efforts at sea were not attempted.

4) Movement of oil under ice is a little understood phenomenon. Spill movement was considered for open water.

5) The primary physical factors influencing a spill, currents (wind-induced, geostrophic, and tidal) and wind stress, are quite variable. Conditions of these factors were averaged for each hypothetical drilling site. In many cases, spills would not reach shore, even from close-in sites. Where a good possibility of a spill not reaching shore exists, it is indicated by a * in time to landfall (as well as low or zero probability according to CEQ).

6) Proximity to resources was assumed to be proximity to nearshore coastal resources. Proximity to offshore resources is a somewhat meaningless concept, due to either motility of fauna, unknown locations and clustering of benthos, patchiness of plankton and schooling of fish, or the ubiquitousness of the biota.

F. Generic Impacts

1. Introduction

The phrase "generic impacts" as used in this subsection refers to the entire range of impacts that can be sustained by various groupings of biotic and socio-economic conditions. The approach taken here is the identification of actual or potential impacts on various classes of organisms, habitats and human uses. The discussion picks up where the previous sections leave off, i.e. the previous sections describe the sources of impact-producing events and the possibilities and probabilities of such events occurring, and to what extent. The generic impacts are those which can be caused if such potential impact-producing events occur. Where threshhold levels of contamination that produce deleterious effects are known, these are presented. In many cases, the actual or potential magnitude of impact can not be estimated with precision. In such cases, the anticipated level of impact is characterized by descriptive adjectives such as low, moderate, high, etc.

For the various biotic groupings and resource categories, assignments were made regarding which of the OCS areas contain such resources in significant or minimal degrees. This approach, and indeed the generic approach in general, was chosen for several reasons. As is apparent from the discussions of impacts on various groups or areas, certain groups are more vulnerable than others to oil and gas activities, e.g. oceanic birds. This fact is most apparent when discussing fish and wildlife resources. Within each OCS region, an effort was made to identify degrees of vulnerability (sensitivity) of fish and wildlife resources which had been grouped into broad categories by life style (shorebirds vs. seabirds, demersal vs. pelagic) and by various factors associated with exposure of life cycle (history) stages (pelagic larvae vs. demersal larvae, pelagic zone adults vs. estuarine adults).

The criterion that has some theoretical and observational support to compare regions is climate, i.e. cold vs. warm conditions. As a generalization, biological systems have a higher turnover in warm regions. Thus, one might expect that recovery from a major perturbation would take less time in a characteristically warm region. However, we have little evidence that successional patterns would duplicate previous ones and our knowledge of ecological compensation with regard to temperature effects is limited. Though complicated, this consideration has some merit to be factored into the decision process.

The organization of the remainder of this section is as follows. Generic impacts on all major resource categories that are found in or on the U.S. OCS will be discussed. These will be followed by a discussion of the impacts that are not unique to any given region but can be expected anywhere to some degree. Then the significant resources of each OCS region will be presented; this is essentially a compilation in tabular form of the resources section presented in Section II prepared by the Fish and Wildlife Service. Finally, region-by-region comparisons of the risks of OCS development will be made. These comparisons will be made by combining the three components analyzed earlier in this section, viz., oil spillage potential, natural hazards, and proximity to coastal resources, into summary characterizations of the impact risk for each OCS area. In Section VIII, resource values and impact risk are considered together in order to develop alternative leasing sequences based on different leasing strategies.

The most severe impacts that can affect organisms and communities are those that result from discharged oil. Oil discharges can be classified as having two causes: 1) accidental discharges caused by well blowouts, pipeline ruptures, and other non-intentional occurrences; and, 2) operational discharges. The more familiar of the two causes, accidental spills, range in size from a few barrels to over a hundred thousand barrels. Operational discharges, those that occur during routine operations such as formation water discharge and separator fluid discharge, are not as visible, but may result in environmental stress of large magnitude that is defined by the "chronic low-level pollution".

It is important to point out that prediction of effects at the community, or even population, level is nearly impossible with our current knowledge. Rarely has an ecosystem been characterized well enough that changes caused by a massive oil spill or chronic pollution can be identified, Several studies have been conducted on such publicized events as the Santa Barbara, San Francisco, West Falmouth, Milford Haven and Cornwall spills. Direct effects were most noticeable to the bird and ichthyoplankton populations. However, quantifiable comparisons were generally not possible in these areas due to scarcities of data on population levels and dynamics preceding the spills.

The generally accepted inability to quantify the effects of large oil spills (chronic effects are even more difficult) makes the prediction of environmental impacts that will result from the accelerated leasing proposal an extremely difficult task. The most feasible approach is to discuss all known impacts in qualitative terms for generic cases.

Five general categories of effects of oil on organisms have been identified in the literature. There are:

1) lethal toxicities
2) sublethal disruption of physiological or behavioral activities
3) effects of direct coating by oil
4) incorporation of hydrocarbons or other noxious substances by organisms, causing tainting and/or accumulation of hydrocarbons and possible transmission through food chains
5) changes in biological habitats

Discharges of heavy metals and other toxic substances also accompany offshore drilling activities. These substances are found in drilling muds, drill cuttings, formation waters, separator fluids, and other effluvia from drilling, production, and workover operations. Also, turbidity problems are associated with drilling operations and pipeline laying.

Continuous or chronic low level releases of oil, drilling muds, and formation water from extraction activities, while not eliciting the catastrophic impact-recovery response of accidental spills, may instead cause subtle changes in birth, death, and migration rates which will only be detectable from natural population fluctuations after long time periods. Similarly, oil deposited in inter- and sub-tidal substrates following an accidental spill may be a continuous source of oil due to slow continuous release of oil fractions from the sediments.

Lethal and sublethal effects on individuals take on significance only insofar as changes are detectable in a population or assemblage of populations (community). Population size and age distribution are two of the principal measures of a species as a resource in an area. Because these population characteristics depend on rates of aggregation of individual births, deaths, and migration, population sensitivity to oil differs significantly from that of individual organisms. These rates are in dynamic balance over time periods measured on the order of years, and are unknown for many species at the present time.

While a spill will immediately increase the population death rate, the magnitude of mortality depends on the nature of the exposure and sensitivity of individuals and life stages. During recovery, the population birth, death, and migration rates as well as predator-prey relationships and community successional phenomena are not in balance. Therefore, the time period necessary for recovery is critical in determining the ultimate effects of a spill. Oil exposure is a very real and serious threat to birds. Extinction is not infeasible. Wide variations in initial kill and recovery can be anticipated as functions of species, season, and spill location.

Transportation of produced oil and gas has serious environmental problems. Where pipelines are used for transportation, the installation and maintenance requirements have unavoidable consequences. When pipelines are buried at sea, a trench is formed by jetting away sediment below the pipe. This activity increases turbidity and may resuspend toxic materials that were trapped in the sediment. Pipelines crossing beaches cause short-term effects (except for periodic maintenance), but where pipes cross wetlands, the pipe channels, access canals necessary for construction equipment, and dredge spoil banks remove habitat and cause drainage and circulation problems. Another onshore impact is the loss of habitat or man-imposed usage that occurs where pipeline terminals and treating facilities are constructed. Farther down the line, oil production enters refineries, either directly from pipelines or after shipment by tankers. Tankers or barges may ship production from pipeline terminals onshore or directly from production platforms. This type of transportation, being on the surface and involving at least two handlings per shipment, is historically more hazardous than pipeline transport.

Refinery construction that will result from accelerated leasing is difficult to predict. Increased domestic production is expected to replace insecure foreign imports, and new refineries would probably be built even with no increased domestic production. However, increased domestic production in widely scattered OCS areas may warrant, for economic reasons, the construction of new refineries near the areas of production. Refineries have direct impacts on land usage, loss of habitat, air and water quality.

2. Impacts on Plankton

Planktonic organisms comprise a wide range of life styles, from the phytoplankton (plants) to the zooplankton (permanent zooplankters, fish eggs and larvae, temporary zooplankters such as larval forms of benthonic organisms). Phytoplankton are generally adversely affected by crude oils and refined products. Laboratory studies have shown that death and growth rate inhibition can occur in crude oil concentrations of 0.001 to 1000 ppm (Mironov, 1970, 1971), although Gordon and Prouse (1973) found enhancement of photosynthesis at concentrations below 10 to 30 ppb. Thus, the possibility of both stimulation and suppression of photosynthesis in areas of chronic oil spillage must be recognized (Boesch, et al., 1974). In general, though, the effects are deleterious at the organismic level, but field measurements (e.g., Santa Barbara) of community primary productivity have generally been inconclusive. However, primary production is inhibited under an oil spill, which naturally blocks out light to various degrees. Another widely recognized impact on phytoplankton arises from heavy metal loadings, which generally are toxic, but have also been conjectured as possibly triggering red tide outbreaks (Ingle and Martin, 1971).

Knowing the low level of oil concentrations that can affect phytoplankton, it is conceivable that the most serious impact comes from chronic low-level pollution. Continuous low-level stress could seriously impair phytoplankton growth at both the organism and population levels. This could lead to serious losses in primary productivity, the basic food production and oxygen formation process of these plants. Primary productivity is generally higher over the continental shelf than over deeper waters, as nutrients can cycle more easily.

Effects on phytoplankton will be of the same general magnitude for the same level of development wherever they occur, although species composition will vary. The exception to this is the possibility that more serious effects will be felt by the phytoplankton in colder climates. Here, where oil does not chemically weather as rapidly and microbial degradation is slower, spilled oil remains longer and thus could impact for a longer period. Toxic water soluble aromatics would have a longer time to dissolve in the water. The additional problem of oil spilled under ice is an unknown phenomenon; if volatiles can not escape, they will tend to dissolve in the water to greater degree, possibly affecting the phytoplankton that live near the ice-water interface.

Most of the data concerning impacts on the permanent zooplankton (holoplankton) is related to copepods (small crustaceans). Several species suffer high mortality after several days exposure to oil in a concentration of 1 microliter/liter of seawater. Longer exposure or higher concentrations (up to 1 ml/l) increased mortality (Mironov, 1970). No information has been found concerning transfer of pollutants from phytoplankton to herbivorous zooplankton. There are other possible effects, however. Primary productivity may be reduced in the phytoplankton via shading of sunlight by spilled oil and thereby affecting the food supply of the herbivories. Shading may also disrupt vertical migration of zooplankton, which is light-cued. Both phytoplankton and zooplankton will also be affected on a small scale because of the turbidity attendant to drilling operations, as well as by the discharge of high salinity, low oxygen formation waters.

Of particular interest are the planktonic larvae of various benthic invertebrates and fish. Many of these species are either actually or potentially harvestable, and impacts on the larvae affect population sizes and distributions. These meroplankters (planktonic for part of their life cycle) are generally considered to be very sensitive to environmental stress and predation while in the water column, although Mironov (1970) concluded they were not as sensitive as holoplankters; they are, however, more sensitive than the benthic adult forms. The meroplankters are subject to the same types of impacts as other planktonic organisms; lab studies indicate that death and abnormal growth can be expected in concentrations ranging from 10-100 microliters of oil per liter of seawater. Fish larvae, such as cod and herring, are susceptible to crude oils (Kuhnhold, 1969). In addition, many species of fish have eggs which float in the water column or at the surface; the eggs of several species have sustained high mortalities in some of the more noted spills.

Many of these impacts are localized and of short duration; however, there are longer term possibilities that must be mentioned because they have been postulated by scientists but not definitively proven. Many of the organisms with high turnover rates (short lives, high reproductive potential) are probably not significantly affected by noxious substances. For the longer lived creatures, other effects may be noted. One is the possibility of food chain magnification of trace toxics. The widely known example of this phenomenon is food chain magnification of DDT. Noxious substances may be concentrated because of selective absorption of materials in specific tissues that are digested by higher trophic level organisms. The possibility then exists of non-toxic levels becoming toxic by this concentrating mechanism. Transfer of these substances through food chains probably occurs; magnification may not.

Lethal and sublethal effects reduce population levels and potential distribution, at least in the short term. Long term reductions of primary and secondary productivity of marine ecosystems may result, but there is no data to support this hypothesis. Of particular concern are the effects on age-classes of commercial fish. There is a natural variation in sizes of year-classes, and the percentage of eggs that reach adulthood is generally quite small. A particular year-class of eggs or larvae may be small due to low fecundity and high predation. The additional stress of a massive oil spill may reduce a year-class to critically low levels.

Like the phytoplankton, the zooplankton will be affected to approximately the same degrees in all areas, given the same level of oil and gas development. The cold versus warm argument applies here also. In areas of heavy commercial fishing, such as the North Atlantic, Gulf of Mexico, Gulf of Alaska, and Bering Sea, eggs, larvae, and juveniles of important fisheries could be affected to a great degree.

3. Impacts on Fish

Little is known about the effects of oil and gas operations on fish at sea. Midwater migratory fish presumably would avoid areas which they sensed were noxious or locally adverse, although some fish might not be able to avoid spilled oil and would suffer from clogged gills and damaged gill tissue. However, tainting of fish is a well documented occurrence, which apparently means that fish can not always detect noxious conditions. Tainting usually results in a loss to commercial fishermen, who cannot sell their catch. Much of the research on the effects on fisheries attempts to analyze declines and rises in catch and catch per effort. In the Gulf of Mexico, where oil and gas operations have been occurring for 25 years, no significant long-term changes in fish catch have been noted. However, the record catches of 1954 have never been exceeded, and recent studies at Texas A&M University indicate that fish catch has remained high due to increased effort. Shrimp catches in the last few years have been declining, both in total catch and catch per effort. No explanation has been offered for these occurrences.

Several physiological - behavioral effects may take place. Oil may affect fish nutrition by blocking taste receptors and mimicking natural chemical messengers which attract predators to prey. Chemical "static" may affect the migratory patterns of fish, an important point to such chemosening migrants as salmon, which may be prevented from finding their spawning stream. It has also been suggested that hydrocarbons may block reception of chemicals necessary for reproductive attraction; social conflict behavior may also result. Oil spills might block the estuarine passage of anadromous fish, thus effectively preventing spawning. Direct mortality with severe consequences could occur if a massive oil spill reached nursery areas at certain times of the year.

Demersal fish, especially those with eggs and larvae that remain close to the bottom, should suffer less impacts than the midwater fish. However, entrainment of heavy hydrocarbons and trace metals in sediments is a constantly occurring fate. These entrained substances may enter sea bottom food chains and adversely affect organisms. Bottom organisms may also be affected by turbidity of drilling and pipelaying operations; pipe trenching may resuspend toxic materials that had been entrained.

Much of the toxicity work on fish has been conducted in the laboratory. Many species die in response to applications of crude oil, refined products, trace metals, and drilling mud components, in concentrations as well as exposure times that could conceivably be encountered in the ocean.

The significant fishery resources (finfish) are found in the North and Middle Atlantic, central Gulf of Mexico, Gulf of Alaska, and Bering Sea. Some impacts on these resources must be expected, although magnitude estimation would be speculative.

4. Impact on Benthic Marine Life

Environmental impacts which may be expected to affect benthic marine life adversely will likely result from the discharge of drill cuttings and drilling muds, accidental and chronic discharge of oil and other toxic materials, and pipeline burial. Heavy mortalities were noted at the West Falmouth spill of No. 2 fuel oil, but resettlement eventually took place to some degree within two years. Nearshore benthos are most susceptible to mortality from oil spills.

Drill cuttings can affect benthic organisms in a number of ways. Many organisms are smothered and crushed outright, since they can't move very well. Other organisms are able to migrate up through the deposit, and some colonize very rapidly. The nature of the cuttings (consistency and composition) may aid or preclude recolonization, however. Attached plants are also exposed to smothering and crushing.

Drilling muds and fine sediment are discharged overboard during drilling operations. This generally creates a plume of fine sediment and mud materials that flows with the prevailing current. The plume may reach to the bottom and deposition would occur. This creates the hazard of clogging of the filter-feeding mechanisms which abound in the benthic community. Respiratory mechanisms are also affected by sediment plumes. Sedimentation is inimical to viable coral reef development, and has been mitigated against where threats to coral reefs exist. Toxic materials are found in drilling muds, including barium (as barium sulfate, the dominant component of drilling muds) which has generally been considered a small hazard because of operator recovery and its low dissociation in sea water.

Most, if not all, benthic biota is either destroyed by the jetting of pipeline trenches or raised into the water column and exposed to predation. Although recolonization could begin immediately, the native biota could not be fully restored until seasonal reproductive cycles had been completed. Turbidity associated with trenching affects filter-feeders and respiration. Resuspension of toxic heavy metals and pesticides will adversely affect local populations.

Benthic marine life includes highly valued shrimp, clams, oysters, and lobsters. Large aggregations of these organisms could be lost, which would be a loss of current commercial value and reproductive value.

Most of the impacts on benthos are of short duration and in limited locales. The long term effects lie in chronic low-level pollution from production facilities and sediment entrainment of long-lasting pollutants.

Many of the commercial shellfish live in nearshore, estuarine, and wetland habitats, both as adults and larvae. One immediately thinks of Maine lobster, blue and softshell crabs, clams and oysters on the East Coast, clams, oysters, blue crabs, and shrimp on the Gulf Coast, dungeness, tanner, and king crabs in Alaska as significant shellfish resources. As was mentioned earlier, many of these valued animals live in already stressed environments. Additional stresses from oil discharges, heavy metal resuspension, and pipeline burial disruption could significantly affect these resources.

5. Impact on Birds

In the past, the injuries and deaths of thousands of seabirds, shorebirds, and waterfowl have been the most obvious impacts of massive oil spills. It has been stated that the only organisms damaged directly by oil pollution on a sufficient scale to seriously affect populations are seabirds. A large number of oceanic and shorebirds die as a result of the oil pollution, and chronic pollution probably kills more every year than die after a single catastrophic oil spill. It has been estimated that total annual losses due to oil pollution in the North Sea and North Atlantic alone (excluding specific disasters) range from 150,000 to 450,000 seabirds.

At least five factors contribute to the precarious status (extreme vulnerability of catastrophic oil spills) of bird populations.

1. Bird kills result from coating of the feathers by the weathered or unweathered petroleum, destroying their insulating property. Diving birds show no awareness of oil slicks and

dive directly into them. Any shore birds moving about along the shoreline could be covered with washed up oil.

2. Bird populations are small and therefore have a high risk of extinction. This means that after the original population (pre-spill) is reduced, natural population fluctuations - easily absorbed in the original stock - could lead to extinction.
3. Bird fecundity - typically two to three young per breeding pair-year - severely limits ability to recoup losses.
4. Maturation usually requires 3-4 years, further delaying recovery.
5. Birds are often highly aggregated, thus exposing the entire breeding population to localized oil slicks.

Significant bird populations exist in most coastal areas, at least for part of the year. Many are migrants, and many are threatened or endangered. Large and diverse bird populations may be found in the marshes and bay areas of the East and Gulf Coasts, as well as in marshes and other wild areas of the Gulf of Alaska, and Bering Sea, especially Bristol Bay. Endangered species may be nearly extinguished if certain circumstances such as a massive spill near a breeding area should occur. Adequate buffer zones and rapidly deployable cleanup equipment could mitigate to some degree these disastrous impacts. Identification of critical habitats is the first step toward such mitigation.

6. Impact on Mammals

The impacts of oil pollution on mammals are poorly known, although generally recognized to less serious than on birds. In the rather closely studied Santa Barbara spill, marine mammal deaths due to oil could not be distinguished from mortality due to natural causes. Mammals can be affected by oil, however. The fur-bearers could be affected like birds, i.e. their insulating capabilities are destroyed. Massive spills could suffocate mammals, and ingestion of oil could result in death by poisoning. Marine mammals may be intelligent enough to avoid adverse conditions, but the avoidance itself may disrupt the herd or the migration pattern. Coating of the sea-land interface could effectively remove breeding and hauling grounds from use, a potentially catastrophic occurrance for some species.

Most of the significant mammal populations are on the West Coast and in Alaska, although porpoises of various species are rather ubiquitous. The resources table later in this section indicates where significant mammal populations are found.

7. Impact on Plants

Various types of plant communities could be affected by the different operational discharges and mechanics. The obvious food and oxygen production of plants can not be overlooked. The phytoplankton community has already been discussed. Benthic algae, seagrasses, kelp beds, nearshore marshgrasses, mangroves, and seaweeds are all communities that could be seriously damaged by: oil spills, chronic oil discharge, drilling mud and cuttings discharges, pipeline laying and access canal construction, and onshore facilities. Large scale impacts on the plant communities, which, while not expected, must be recognized for their potential impacts on the entire food chain.

8. Impacts on Unique and Highly Valued Areas

At a higher level of organization than the organism or population level are those areas with distinctive biological characteristics that set the areas apart from surrounding areas. These areas include the marshlands and barrier islands of the Atlantic and Gulf of Mexico coasts, mangrove swamps, wildlife refuges and sanctuaries on all coasts, coral reefs and isolated reef-type communities.in the Gulf of Mexico, shellfish and worm reefs on the Atlantic and Gulf of Mexico coasts, kelp beds in California, bird rookeries, pinniped rookeries on the West Coast and in Alaska, and the numerous topographic highs that serve as commercial fishing banks in the Gulf of Mexico. Potential impacts on these areas are more important because of the intrinsic value of the areas, and the relationships and dependencies within the areas that could be disrupted by impacts on one component.

Marshlands and barrier islands can be affected by repeated oilings, but the single large oiling apparently does not prevent recovery of the area. In fact, moderate oilings have apparently produced in increase in production in marshlands. Chronic oil pollution has decidedly deleterious effects on marshlands, however. Mangrove trees have been killed by oil spills. The primary adverse impact on these areas derives from pipeline traversing. Construction and maintenance of pipelines entails channel dredging (both for the pipes and equipment access), the presence of equipment and manpower, creation of dredge spoil banks and the attendant turbidity and resuspension of toxic substances, and alteration of salinity and circulation patterns from channel creation. All these activities can result in decreases in vegetation and habitat for organisms, as well as affecting the water quality on which the spawning and breeding of many commercially valuable species depends.

Wildlife refuges and sanctuaries (including estuarine and marine sanctuaries) are created specifically for removal and protection from man-induced activities. The introduction of possible impacts from OCS activity impinges on this basic justification for existence, in addition to the value of the areas in purely ecological terms. The same types of activities mentioned previously could affect these managed areas, such as oil spills and pipelines; onshore facilities might also be sited in these areas. It must be noted that, in most cases, there are stringent regulations regarding activities other than those for which the managed areas were set aside.

Topographic highs or banks are distinctive features on much of the OCS in the Gulf of Mexico.. When shallow enough, they may be capped by coral reefs or reef-type communities that are extremely valuable to scientists and the public. The banks also serve as habitat for large schools of commercial fish such as snappers and groupers. These features are at some depth below the surface and would not be directly affected by spilled oil. Primary impacts would come from sedimentation from drilling and pipelaying operations, and mechanical disturbance from fixed platform siting and pipeline crossing. Sedimentation is inimical to reef communities, platforms may cause congregation of commercial fish (thus making it more difficult for fishermen to catch them) or drive them away from these traditional fishing areas, and pipelines may cause fishing gear hangups. Chronic pollution by oil and other toxic substances may be injurious to both reef communities and commercial fish populations.

Shellfish and worm reefs are found in many areas of the Atlantic and Gulf of Mexico coasts, generally in estuarine locations. Oysters and clams are among the most important commercial intertidal and shallow subtidal organisms of our coasts. Intertidal and subtidal organisms potentially suffer the most damage from spilled oil, either through smothering, fouling, or direct poisoning. Toxic lethal effects are generally rare from a single oiling; mechanical lethality is more common. However, chronic exposure appears to be more harmful than single, isolated oilings; and in chronic exposure, toxicity may be a more important impact-producing factor. Many nearshore and estuarine areas harboring large concentrations of oysters, clams, and shrimp are already stressed from sewage and industrial discharges. Additional loadings from oil spills and chronic oil pollution may reduce commercial harvest because of tainted taste or health hazards.

The unique kelp beds in Southern California harbor a diverse community of organisms, as well as being of commercial importance. Oil does not appear to significantly damage kelp itself, but may affect other organisms in the community. Some impacts to the kelp may result from laying pipe through the beds.

Rookeries exist in many areas of the U.S. Coast. Bird rookeries will be threatened by human activity associated with operations, pipeline traversing, construction of onshore facilities, and oil spills. Oil spills that approach bird rookeries have potentially serious consequences because of the concentration of birds that may be found at certain times of the year. Pursuit of food may cause large numbers of birds to contact oil on the water.

Pinniped rookeries and hauling grounds are primarily threatened by human activity; in comparison, contact with oil is not as significant a problem. Platform construction and maintenance, pipelaying, and onshore construction near breeding and hauling grounds may cause abandonment of the grounds. Many pinniped species utilize only one area for breeding, and forced abandonment of a breeding area would have serious repercussions within the pipulation. Sea otters are one group that suffer from contact with oil; like birds, their coats lose insulating qualities when oiled.

9. Impacts on Commercial and Sport Fisheries

a. Removal of the Sea Floor From Use

Those fisheries involved with exploitation of bottom or demersal species are impacted by the removal of fishing grounds. All sites occupied by drilling or production platforms, as well as attendant service boats and barges must be avoided by fishing boats. Fisheries involved include shrimp (the most valuable fishery in the U. S.), lobsters, Pacific coast crabs, and bottom fish (flounders, halibut, industrial groundfish). Jack-up drilling rigs or permanent production platforms effectively remove two to five acres of fishing area per structure. In deeper waters (over 100 meters), a semi-submersible drilling rig with a 300 meter anchoring radius would remove up to 70 acres. The duration of the exploratory drilling ranges from about 45 days for a single well to around six months for multiple well explorations. Permanent production platforms may remain in place for 10 to over 20 years.

Structures placed on the sea floor are known to attract large numbers of fish in the Gulf of Mexico and California. (There is no evidence that these new populations are made up of displaced individuals from nearby populations). Commercial and sport fishermen work around these rigs because of the large populations of fish commonly found there. However, purse seining, which requires a large amount of area, may be somewhat restricted by close spacing of rigs and platforms. The total number of platforms required to develop a lease area and their spacing relative to each other are important factors in considering potential impact on commercial fishing activities. In addition to the removal of the sea floor for fishing, the structures and additional traffic increase the congestion within an area, requiring fishermen to spend more time navigating and avoiding collisions.

b. Creation of Obstructions

Offshore oil and gas operations create obstructions on the sea floor, such as underwater stubs, subsea completions, large pieces of debris, and buried pipelines. Underwater stubs present a hazard to trawlers (shrimp, bottom-fish) in that if the net is towed across a stub, the net will certainly be badly damaged or lost.

Large pieces of debris, such as equipment, piping, structural members, tools, etc., may accidentally be lost off a platform, service boat or barge. If these pieces are not recovered, they may cause damage or destruction of nets or other fishing gear which encounter them.

Unburied pipelines (beyond the 200 foot depth contour) may pose a problem to bottom trawl fishermen. However, about 90% of the Gulf of Mexico shrimp catch was harvested inside the 120 foot depth contour. Pacific coast shrimping grounds are generally in areas of low petroleum potential (northern California, Oregon). California trawling fishermen have indicated unburied pipelines may pose some problems, but felt they could maneuver their vessels so as to minimize damage or loss of their nets (U.S. Geological Survey, 1974). Due to unstable bottom conditions, the gradual exposure of once-buried pipelines may present even more difficult problems offshore New England. Pipeline corridors and pipeline burial out to the 200 foot depth interval within a lease area reduces the hazard, although this is not required of all pipelines shallower than 200 feet.

c. Contamination of Fish by Spilled Oil

Fish which are either externally coated or internally contaminated with oil are unmarketable. It has been shown that organisms living in the vicinity of chronic oil spillage are likely to be internally contaminated (Connel, 1971; Scarratt, 1971). The extent of contamination in offshore waters is not detectable, but is so in some coastal areas where water-borne or water-soluble petroleum products can become concentrated.

A secondary impact of oil contamination of fish and shellfish is that the marketability of these fishery products is initially reduced due to the direct health or esthetic effect of the oil. The fishery product may gain a poor reputation and the economic effect may far outlast the period for which the fish are actually tainted.

d. Reduction of Fishing Effort Due to Spilled Oil

Oil spills may reduce fishing effort, which in turn reduces the total catch. Effort reduction occurs when oil actually fouls fishing nets and gear, or the presence of oil in the water restricts fishermen from fishing for fear of fouling their gear. Straughan (1971) indicated that landings of rockfish were greatly reduced in the Santa Barbara area because of a reduction of fishing effort caused by oil contamination of boats and gear, as well as the negative esthetic appeal of fishing in polluted waters.

Areas of chronic oil pollution may also foul fishing gear on occasion, resulting in extra expense and reduced fishing effort while cleaning or replacing the gear. This may be significant where large purse seines are used at the surface (such as for Alaska salmon).

(e) Removal of Onshore Sites Considered for Aquaculture

Aquaculture of marine organisms, such as clams, oysters, and juvenile salmon is emerging as an industry. Pollution effects can be severe on this industry. Clark and Finley (1971) stated that a single large oil spill in Puget Sound could destroy the area's extensive aquaculture industry. These authors noted that the State of Washington denied oil and gas lease applications in Puget Sound. The state considered such action incompatible with a potential multi-million dollar a year seafood cultination industry.

Future seafood aquaculture industries may refrain from establishing operations in areas associated with petroleum products if a pollution potential exists.

f. Sport Fishing

Although we have no conclusive evidence, it is our opinion that a major oil spill would affect sport fishing adversely. Boat fishermen would not want to soil their boats by fishing in the vicinity of an oil slick and neither boat nor surf fishermen would want to keep fish that had been coated or contaminated with oil. Therefore, sport fishing would be curtailed in the vicinity and for the duration of the spill incident.

We have received extensive testimony and evidence that overall, oil and gas operations have a favorable impact on sport fishing activities. The favorable impact is the result of sports fish population enhancement due to the artificial reef effect on offshore platforms. In the open sea, offshore platforms provide both food and cover in areas that are largely devoid of those essentials. Myriad forms of microorganisms in the water drift by these structures and attach themselves, soon encrusting all exposed surfaces on the platform. The average platform in 150 feet of water provides 90,000 square feet of hard surface for encrusting organisms. Hard substrate is necessary for encrusting organisms such as barnacles, hydroids, corals, mussels, and other invertebrate organisms which serve as links in the food chain. Randall (1963) has stated that artificial reefs provide protection, food sources, spawning sites, and spatial orientation markers for fishes. The same author found that artificial reefs attract available fish from surrounding waters, and increase the size of some populations by providing additional protected areas and food for both young and adults.

10. Impacts on Recreational Values

If pipelines which result from a sale are brought ashore in a beach area used for recreation, there will be an impact on recreational activities. The area of a beach disturbed by pipeline construction will be small (about 30-50 feet wide), and the first high tides following burial of the pipeline will serve to restore the beach terrain. Restoration of the beach rig will take longer, most likely requiring a storm tide or high winds to obliterate the effects of excavation. Physical interference with recreational activities from excavation will be minimal and short-lived.

If pipeline terminal or transfer facilities are located in or near a beach or other area used for recreation, there will be an adverse impact on recreational activities from disruption during the construction phase and elimination of about 40 acres per terminal plant for recreational uses. This latter impact would be long-term and restoration of the area, if attempted at all, would have to await depletion of the offshore production which the plant would be designed to serve. These impacts will diminish the quality of the area for recreational enjoyment.

The impacts of pipeline and terminal facilities construction on recration would be mitigated somewhat if the appropriate governmental authorities were to allow this type of construction only during the time when recreational use of the area is at its lowest point.

The impacts from permanent terminal facilities could be mitigated somewhat by locating them at some distance inland where recreational use is not intense. State authorities may wish to consider this alternative.

Water sports, such as swimming, diving, spearfishing, underwater photography, fishing for finfish and shellfish, boating and water skiing would also be directly affected by an oil spill.

Other seashore related activities such as beachcombing, shell collecting, paiting, shoreline nature study, camping and sunbathing would be made much less attractive for an indeterminate period where an oil spill had coated a beach.

Removal of oil from beaches used for recreation in the area under consideration would probably involve removal of the contaminated sand and possible, replacement of the sand if needed. The time required for clean-up in this case would depend on the extent of beach affected. Recreational use of the area would be precluded during the time that oil covered the beach and during the clean-up process also.

The impacts of an oil spill discussed above would be more keenly felt if the recreation area involved is intensely used or considered to have unique or outstanding recreational values. Not only would the impact be felt by the recreational users of these areas but, consequently, the community of businesses whose economic well-being depends on use of their recreational resources by tourists would be affected. If an oil spill were to cover outstanding recreational beaches during the height of the recreational season, the impact could be expected to be more sever, in that residents and tourists would not be attracted to a beach area contaminated by oil or undergoing a clean-up process, and there would be a resultant economic loss.

An area-by-area description of recreational resources which might be affected by proximate oil and gas development can be found in Table 119. The heavily used areas of Long Island, New Jersey, Maryland, Virginia, many parts of the Gulf Coast, Southern California, Washington and Oregon are the ones that could be severely affected by offshore oil and gas operations, primarily by the massive oil spill, or several smaller spills.

11. Impacts on Endangered and Threatened Species

The term "endangered species" means any species which is in danger of extinction throughout all or a significant portion of its range. An endangered species is one whose prospects of survival and reproduction are in immediate jeopardy. Its peril may result from one or many causes such as disease, predation by other animals, overhunting, competition from a more aggressive species, or changes in and loss of habitat. In this category are 108 species of mammals, birds, fish, reptiles, and amphibians.

The term "threatened species" means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. As long as conditions remain stable and favorable, such species may continue to survive a limited number. When a threatened species occupies a limited habitat, adverse influences are more critical, and unfavorable changes in its environment may quickly make it endangered. In this classification are about 45 species of mammals, birds, fish, reptiles, and amphibians.

The Endangered Species Act of 1973 (P.L. 93-205) explicitly directs all Federal agencies and departments to insure that any actions taken by them do not jeopardize endangered or threatened species. Of concern are impacts that could result to endangered and threatened species which utilize the areas proposed for OCS oil and gas development. Specifically, Section 7 of the Endangered Species Act of 1973 states:

> Section 7. The Secretary (of the Interior) shall review other programs administered by him and utilize such programs in furtherance of the purposes of this Act. All other Federal departments and agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species listed pursuant to Section 4 of this Act and by taking such action necessary to insure that actions authorized, funded or carried out by them do not jeopardize the continued existence of such endangered species and threatened species or result in the destruction or modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with the affected States, to be critical. (ly U.S.C.§ 1536) (emphasis supplied)

This section requires the heads of Federal departments and agencies to use their authorities in order to carry out programs for the protection of endangered species and it further requires that those agencies take the necessary action to insure that their activities will not jeopardize the continuing existence of endangered species or result in the destruction of critical habitat of those species.

Critical Habitat

A notice which has been published in the Federal Register by the Department of the Interior and the Department of Commerce (FR Vol. 40, No. 78; April 22, 1975; pp. 17764-17765) provides a concept of "critical habitat" as it relates to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1543). The concept is as follows:

> "Habitat" could be considered to consist of a spatial environment in which a species lives and all elements of that environment including, but not limited to, land and water area, physical structure and topography, flora, fauna, climate, human activity, and the quality and chemical content of soil, water and air. "Critical Habitat" for any endangered or threatened species could be the entire habitat or any portion thereof, if, and only if, any constituent element is necessary to the normal needs or survival of that species. The following vital needs are relevant in determining "critical habitat" for a given species:
> (1) Space for normal growth, movements, or territorial behavior;
> (2) Nutritional requirements, such as food, water or minerals;
> (3) Sites for breeding, reproduction, or rearing of offspring;
> (4) Cover or shelter; or
> (5) Other biological, physical, or behavioral requirements.

Under this concept, the destruction, disturbance, modification, curtailment, or subjection to human activity of habitat considered "critical" for a given species would not conform with section 7 of the Endangered Species Act of 1973, if such an action might be expected to result in a reduction in the numbers or distribution of that species of sufficient magnitude to place the species in further jeopardy, or in a restriction of the potential and reasonable expansion or recovery of that species. It must be emphasized that because the primary intention of the Fish and Wildlife Service and the National Marine Fisheries Service is to maintain and restore presently threatened and endangered species, application of the term "critical" is not restricted to the habitat necessary to support a minimum population. It is emphasized further that only specific kinds of actions are detrimental to habitat regarded as "critical" as defined above. There may be many kinds of actions which can be carried out within the "critical habitat" of a species that would not be expected to result in a reduction in the numbers or distribution or otherwise adversely affect that species.

Spceific types of actions which may destroy or modify critical habitat are listed below and include, but are not limited to:

(1) Elimination or denial of access of any area or volume of land, water, or air utilized by an endangered or threatened

species at anytime of the year or during any part of its life cycle, the loss of which would not or could not be fully compensated for by the species involved, or which could be compensated for, but only through displacement of another Endangered or Threatened species.

(2) Modification or destruction of topographic, aquatic, faunal, vegetational, or other features, which could (a) disrupt migrations, movements; eliminate cover, food supplies, shelter, or sites used for denning, nesting, spawning, breeding, or roosting; or otherwise interfere with the life pattern of an Endangered or Threatened species to the extent that such a species is unable to continue to exist in a fully wild state or to produce and rear offspring in a normal manner; and/or (b) allow another species, with the potential of competing with, hybridizing with, or preying upon an Endangered or Threatened species, to increase in numbers, distribution, or viability in the habitat affected.

(3) Modification of the quality, temperature, or chemical content of the soil, water, or air of the habitat affected which would result in harmful behavioral, physiological, or morphological effects on an Endangered or Threatened species.

(4) Human activity, including, but not limited to, construction and use of buildings, roads, trails, power lines, and other facilities; utilization of machinery, boats, vehicles, aircraft, or snowmobiles; agriculture; mining; drainage; exploration for fuel sources; disposal of refuse; application of pesticides or herbicides; and recreation which would be expected to (a) interfer with or disturb an Endangered or Threatened species to the extent that it would suffer harmful behavioral, physiological, or morphological effects; or would be unable to continue to exist in a fully wild state or to produce and rear offspring in a normal manner; and/or (b) bring about situations in which the taking of an Endangered or Threatened species may become advisable for human safety or health.

A specific example of an area delineated as a critical habitat could be as follows:

Grus americana (Whooping crane). The Aransas National Wildlife Refuge in Aransas and Refugio Counties, Texas, and adjacent areas of land, water and airspace delineated as follows: starting at a point one-half mile farther north along the shore of San Antionio Bay than Mosquito Point in southwestern Calhoun

County until it reaches a point on the shore of Shoalwater Bay, thence along a line to a point at the extreme western tip of Vanderveer Island, thence along a line due southeast until it intersects the existing road that extends down the middle of Matagorda Island, thence southward along this last named road until the road reaches the vicinity of Cedar Bayou at the extreme western edge of Matagorda Island, thence approximately four miles southwestward along a line to a point on St. Joseph Island with the coordinates 28°02'N96°55'W, thence northwestward to the bridge that connects Goose Island with the mainland of the Lamar Peninsula; thence northward to a point with the coordinates 28°02'N96°57'W, thence eastward to the point of origin.

This area is the only wintering site of the last surviving wild population of whooping cranes. The population is entirely dependent on this area and on the food supplies, cover, and isolation that it provides. The destruction or modification of this habitat could result in the extinction of this species.

Vulnerability to Impacts

In the conduct of its mineral leasing and development program, the Department will comply fully with provisions of the Endangered

Species Act of 1973. A number of species officially classified as endangered or threatened could conceiveably be affected by spilled oil and chemical pollutants, physical placement of pipelines and other facilities, and various other activities associated with exploration and development operations. The whooping crane has been mentioned. Other birds include pelicans, bald eagles, peregrine falcons, rails, etc. Several sea turtles are on the endangered list as well as a number of whales. It is not the intent of this statement, however, to discuss the likelihood of any particular endangered or threatened species being adversely impacted nor the relative vulnerability among or between groups. A region by region list of all the endangered or threatened species that could conceiveably be affected concludes the previous Section II. The reader may consider this list in light of preceding generic discussion of impacts. A careful evaluation of possible impacts to endangered and threatened species will be made in connection with each site-specific environmental analysis. At that time consideration will be given to appropriate means to avoid damage to any such species which may appear to be vulnerable.

G. Impacts Not Specific to Region

This chapter has dealt so far only with those impacts which could be expected to differ systematically from region to region, even though in the case of biota it was quite difficult to estimate the exact nature of these probable differences. The discussion now turns to impacts which are expected to occur either (1) everywhere development takes place in roughly the same degree, e.g., on air and water quality or (2) somewhere, but in no specific locale that can at this time be predicted, e.g., impacts on archeological sites or on communities in which new refineries might be located.

1. Socio-economic Impacts

This section describes briefly the onshore requirements of exploration, development, production and processing of offshore oil and gas resources. It sets out those onshore facilities described previously in the description of the operations procedure (I.C.) and indicates general land and employment characteristics of each. In addition, it attempts to highlight the factors which will determine how these requirements are met under different circumstances and within given regions for particular lease sales.

The discussion of the onshore operation is oriented particularly to those frontier areas which will require the most in terms of new onshore facilities. It attempts to describe what the requirements will be and what the potential impact of those requirements might be.

a. Exploration Phase

The primary activity of the exploration phase is "wildcat" drilling, which has been described previously. Exploratory drilling is generally conducted on a contract basis. Operation of a typical rig requires about 110 people, about 70 of whom would be contract crew. Other people involved are dockside crew, company supervision, and certain service support related to each rig. Most of these persons work five to seven day shifts. In some of the frontier areas local people (from the area being explored) could be hired for some of the work. Many of the jobs connected with exploratory drilling are specialized, but some of these skilled jobs are of a nature that make it relatively easy to utilize skills found in the local job force of an industrialized area such as the Mid-Atlantic. Still other jobs are unskilled and would require no special training. Most training of the new persons hired locally for jobs which require special skills would be conducted at the onshore operations bases. Some employees might eventually be sent to universities for specialized courses.

The total number of persons involved in the exploratory drilling phase will depend on the number of rigs working. The number of rigs, in turn, will depend on the number of tracts leased in a given area and the lessee's expectations concerning the richness of the oil and gas resources. Each rig usually can drill from four to six wells per year.

An onshore operations base supporting production of 200,000 barrels/day requires employment of approximately 136 persons. Over half of these employees would be involved in marine transportation. Others would include helicopter pilots and mechanics, administrative personnel and those engaged in other support services. Few of these persons require skills so specialized that they would have to be brought in from a developed OCS region, but rather could come from the locality or region depending on the skills of the job force in the area.

Each of these bases would require about 50 acres of land and a dockside location. They would require dockspace, warehousing, office and parking space. Channel depths of about 15 feet would be required for supply boats operating out of the dock facilities. In an industrial location, little impact would be felt, beyond the relatively small employment requirements. In a non-industrial area, the impact felt would depend on the use of the surrounding area and the pervious use of the site itself.

Operations bases would not be constructed until at least a year after leasing of an area takes place. Prior to the construction of bases, new leasing areas would be serviced from existing bases in regions like southern California and the Gulf of Mexico. In areas where there has been no previous OCS development, service would initially be provided by companies in the Gulf of Mexico or other established regions.

The number of operations bases in a given area will depend on several factors: the number and distribution of lease holdings, the number of companies with holdings, the amount of dependent activity, and the distance from the onshore base to the leased tracts. In the North Sea, the 150-200 mile range of the helicopter in use and the economics of supply ship operations necessitates the use of the Shetland Islands and to a lesser extent, the Orkney Islands, for onshore operations to service northern tracts. They are the only land sites within the feasible range. In the Gulf of Mexico, distances and land availability have not been important constraints, and operations have evolved over a long period of time. In that region, individual companies commonly have separate operations bases scattered along the Gulf. In a new area, fewer sites would be needed if companies built and operated cooperatively out of the same onshore bases.

In siting the bases, appropriate sites, with protected waters, adequate channels or bottoms suitable for channels, and access to open water, must be located. Ultimately, which sites would be used would be controlled by local zoning policies and other land use regulations.

The service support companies which would be involved in the exploration phase, both those specialized to the oil industry and those of a more general nature, are usually small. In the case of the Mid-Atlantic, probably none of the new individual companies would employ more than about 25 persons. Some of the specialized companies would require experienced people who could be expected to move into a newly leased area. However, many of these companies could hire employees from the existing job force in the area.

Much of the required service support might already exist in any given new frontier area, e.g., trucking companies, welding shops, machine shops, and cement companies. Specialized services which would eventually be required in a frontier area include drilling mud suppliers, specialized tool and equipment suppliers and so forth. Industry representatives have indicated that specialized new companies would probably not locate in a new area until there are 10-20 rigs (exploratory and/or development rigs) working in an area. One or two of each of these various companies might be needed for that number of rigs. As with the type of services provided out of operations bases, specialized service support in a new area would probably be provided out of existing port and warehouse facilities in currently developed OCS areas. In the frontier areas off Florida leased in December 1973, almost all services for the six rigs working there are provided from existing Gulf of Mexico companies further west. The only known specialized company to locate there so far is a drilling mud supplier. The location of service company bases is fairly flexible. They need not locate adjacent to operations bases, for example, they may be more likely to locate near the source of their necessary materials (chemical companies, parts for equipment shipped in, etc).

The exploratory drilling phase usually requires the largest number of non-resident employees because of the skills needed in the temporary nature of the work. If a frontier area is regarded as a desirable place to locate, it is possible that some presently contracted crew members would choose to relocate in the area. On the other hand, they may continue to commute from their residence to the area being explored, particularly in a region like Alaska which is remote and where the climate is relatively inhospitable. In most areas, rig works and support companies and their employees could be expected to be dispersed in a region. However, in Alaska and possibly in parts of the South Atlantic area where there are fewer industrial/commercial and population centers, services and new residents may tend to concentrate in one or more areas.

Platforms must be constructed for the development and production phase. The U.S. now has platform fabricating yards in Louisiana, Texas, and California. Platforms have been constructed in these yards and transported to many other offshore areas including the North Sea. Platforms for frontier areas could be constructed in these existing yards. If additional capacity is needed, existing yards could be expanded or new yards might be built in frontier areas nearer to production. Since traditional shipyards are usually not suitable for platform fabrication, a new site would be needed for construction in the frontier area.

The President of J. Ray McDermott and Co., Inc., a major fabricating company in Louisiana, presented testimony at the Council on Environmental Quality hearings concerning platoform construction for the Atlantic OCS. He indicated that in the early stages of development, platforms would probably be supplied from fabricating yards in the Gulf of Mexico area. Onshore needs in the Atlantic coastal area would include dock space to land crew and supply boats. A temporary office trailer would be sufficient for conducting administrative matters. After the first four or five years of offshore activity, a fabrication site in the area of activity might be desirable because of the volume of work. The new yard should be located on an island waterway that has unobstructed access to the ocean so that the yard's products could be easily transported on conventional cargo barges to the open sea, and should be close to rail, highway, and inland waterway transportation, preferably in an existing industrailized area. His company's yard in Louisiana employs 2400 people. It would take a minimum of five, and more probably eight, years to reach such an employment level in a new yard.

Brown & Root, another major platform fabricator, has taken a different approach. It has already purchased land for a fabrication facility in Cape Charles, Virginia, which is on the Delmarva Peninsula and near the major shipbuilding area around Norfolk. Since the site is in a county with no industrial zoning, the construction of the facility is contingent upon a favorable zoning ruling. If the facility is constructed, platforms could be constructed for the Atlantic OCS as well as other offshore areas, depending on where platforms are needed when the company is ready to seek contracts. Since other items can be produced from such a facility, including light metal tanks, metal storage bins, LNG tanks, and structural modules, its economic viability would not necessarily be dependent upon platform fabrication.

Ultimately, State and local controls will determine whether any such facility is located in a given area. The location of a platform fabrication yard in a frontier area would ba a major industrial development, although the magnitude of its impacts would be determined by its size, capacity, and range of products constructed. Such a facility would have the same type of socio-economic impacts as similar large scale construction and assembly complexes, but these impacts would vary depending upon the character and level of industrialization of the locality.

b. Drilling and Production Phase

Development rigs are similar to exploratory rigs in terms of their requirements; however, the crews are smaller-about 65 people. The development drilling stage is much less mobile in nature, and most, if not all the employees could be expected to live in the area, with the possible exception of Alaska.

Platforms require crews of only about 16 persons. With the exception of trained supervisors, the skill requirements are not highly specialized, and in most areas crew members could be hired locally. Some of these persons could be "recycled" from the earlier phases; that is, rig workers could be trained to work on platforms.

As indicated previously, operations bases and service support companies would continue to service offshore operations in development drilling. The bases themselves and many of the service companies would also service the production phase. In the development of any region, exploration and evelopment overlap. Hence, in the development phase additional operations bases and support companies may be necessary as development gets underway, as previously discussed.

c. Transportation of Crude Oil and Gas

(1) Terminals

Terminals are designed to receive, store, and discharge crude oil or products by pipeline, truck, tanker, or railroad; they may be marine, coastal, or inland. Offshore crude oil loading terminals are located near the gathering center for the production field where tankers may safely berth. Similarly, discharge terminals are located in safe deepwater areas convenient to the market center, and often require modification of existing harbor facilities or creation of new facilities. Product terminals, unlike crude terminals, are almost always owned by an individual marketing company, and are located near the market center. They are fed from refineries by pipeline, river barge, or tanker. From the product terminal, the product is moved by road, rail, or truck, to the market.

Facilities which may be found in the terminal are: storage tanks, docks, tanker loading and ballast water treatment facilities, power plant and vapor control facilities, an office building, fire pump building and fire station, warehouse and shop building, and oil spill contingency equipment.

The North Sea is a case where offshore discoveries and subsequent export of crude oil have resulted in the need for reception and export terminals. A land based terminal is being constructed at Flotta Island in the Orkney Islands. The terminal will have five 500,000 barrel (each) capacity storage tanks, and mooring berths designed to load tankers of up to 200,000 tons at a rate of up to 80,000 barrels per hour. A 125 mile, 500,000 barrels a day capacity submarine pipeline with an outside diameter of 30 feet, will be constructed. The terminal site will be about 250 acres. About 900 men will be employed in construction, and later, about 80 in operation. Estimated construction cost is about $50 million, and estimated operation cost is about $5 million per year at the initial operating level of 250,000 barrels per day.

Also found in the North Sea is an alternative type of reception and export facility, the Brent Spar oil storage and tank loading unit. This huge bottle shaped structure, the first of its kind, is a floating storage buoy anchored with six lines, each terminating in an anchor pile. The unit has 300,000 barrel crude storage capacity and can load 70,000 ton tankers moored to it. The advantages of the design are that the tank can be moored in relatively deep water, and can be disconnected from the piles and moved to another location. The buoy consists of three vertical cylinders, one on top of each other, which have a constant draft when in operation. The lowest submerged cylinder contains storage tanks and buoyancy and trimming tanks. The upper cylinder contains four decks, a turntable with a cargo crane, a loading swivel, helicopter platform, living quarters, power generation, tanks, pumps, and a tanker mooring and loading point.

The need for and location of any terminal facilities in response to OCS development in frontier areas will depend on location and size of crude reserves, available refinery capacity, and availability of onshore sites. If a refining center is relatively close or volume of crude is large enough, the crude may be transported by pipeline to the refinery, and no offshore loading terminals would be indicated. If terminals were to be constructed, they could be either land based crude reception and loading terminals, or floating storage terminals similar to the Brent Spar unit. Among the potential environmental hazards associated with terminals are fires or explosions, oil spills, and escape of petroleum vapors. Terminals may be considered by some to be aesthetically undesirable.

(2) Pipelines

Socio-economic effects of pipelines are minimal. Very few persons would be employed in operating and maintaining the facilities. Land use impacts of onshore pipelines would be similar to those for any pipeline.

Oil storage tanks require the greatest amount of land of any element in the transportation system. The amount of land needed depends on the number of tanks needed and how the tanks are constructed. The diameter and height of the tanks could be adjusted either to reduce visual impact or reduce the amount of land required. Since the siting of storage tanks is flexible because their function is not site specific, they can be sited along a corridor where they would be least obstructive and present the least conflict with other land use, as well as where potential environmental effects would be minimized.

A primary consideration is determining a pipeline right-of-way is to get the oil or gas from the producing area to its destination (refinery, gas processing plant, or oil terminal facility) by the most economical method. Since offshore pipelines are considerably more expensive, the shortest marine route to land is generally most desirable. There are significant constraints on utilizing the most direct corridor: topography, environmental values, and regulatory and jurisdictional considerations. Federal regulatory procedures have already been described. States have jurisdiction within the three mile limit over marine pipeline right-of-way, and onshore States and/or localities have control over placement of pipelines.

Proper planning can help minimize adverse land use and environmental effects caused by construction or existence of onshore pipelines. The kind of impact which pipelines cause will depend on the type of area they traverse. Buried onshore pipelines would generally not affect land use except to preclude certain uses within the right-of-way. Existing transportation corridors would be used to the maximum extent possible. In some cases, it may be possible to further apply the multiple-use concept for transportation and utility corridors. This concept has been applied to pipelines, sewer interceptor lines, etc., in order to minimize adverse effects and take advantage of possible beneficial effects. Such rights-of-way have been additionally utilized for green belts, bicycle paths and other transportation and utility rights-of-way. In order to effect these uses, agreements between joint rights-of-way users or outright purchase of the right-of-way instead of easements is usually necessary. The extent to which these measures could be accomplished would depend partially on early planning and cooperation. Since onshore pipeline location is controlled by State and/or local jurisdiction, much of the burden for controlling and planning for onshore pipeline corridors will fall to these jurisdictions.

d. Processing of Oil and Gas

(1) Oil Refining

Although total national oil refinery capacity has expanded relatively slowly in recent years, it is likely that capacity will grow more rapidly in the next decade. All or much of this growth will occur whether the OCS is developed or not. If the OCS is not developed, oil that could have come from the OCS will be imported from abroad; and much of this oil will be brought here in crude, rather than refined form. Hence the "base case" against which environmental impacts due to OCS-induced refinery operations should properly be compared already contains a good deal of environmental impact. The effect of subtracting base case projections from OCS projections, therefore, is to make the probable net environmental impact of OCS-induced refinery operations rather small if not zero.

Indeed, if in the 1980's we are refining any imported crude whatsoever, it will be appropriate to construe OCS oil as an exact barrel-for-barrel substitute for imported oil. Under these conditions, OCS-induced refinery capacity additions minus base case projected additions would be exactly zero.

This is an important point, which the CEQ study OCS Oil and Gas - An Environmental Assessment fails to appreciate. Resource Planning Associates (RPA), which served as consultants to CEQ on this portion of the study, also missed this point. The CEQ report states:

> "OCS production impacts were assumed additive to base case development on both coasts. As such, OCS production would supplement crude oil and gas imports and would require new refinery and gas processing capacity. In practice, OCS production may replace some imported crude. Despite this possibility, the number of base case/OCS impact case combinations is sufficient to include the absolute level of refinery production possible under a varity of situations. All combinations are examined in detail in RPA's report."

The correct way to look at the situation is not that "OCS production may replace some imported crude" but that imported crude would replace OCS oil. OCS development, therefore, will not induce more new capacity, in the aggregate, than would otherwise occur.

The environmental impact of OCS-induced new capacity might differ somewhat from the impact of new capacity to accommodate imported crude, however, mainly because of the location of the new capacity might be different under the two cases. For instance, a refinery that would have been built in New Jersey, say, to process Persian Gulf crude for transshipment to New England might instead be built in Maine, were crude oil to be found and developed in the Georges Bank area offshore New England. One potential site would in effect be displacing another.

In practice, however, it is hard to see why this displacement process would occur to any great extent. One reason is that the economics of refinery siting have less to do with proximity to sources of crude than with proximity to markets for the refined products and access to transportation networks. Exactly where the crude oil comes from (the Persian Gulf or the OCS, let us say) may make relatively little difference to the refinery siting decision, therefore.

Economic factors are themselves often dominated by political factors in such decisions also. Another important deficiency in the CEQ study is the failure to recognize the substantial ability of States and localities to control development, especially development the size of a modern petroleum refinery. New England has no refineries, despite repeated attempts by oil companies and financies to construct facilities in the region and despite the high price penalties New Englanders pay for having their refined petroleum products transported to the region over great distances. Last year, the town of Durham, New Hampshire, successfully thwarted plans by interests associated with Aristotle Onassis to build a refinery complex in the town. State and local governments thus have preeminent control over whether Federal OCS oil is landed within the State, either for processing or for storage. Neither the Federal Government nor the oil companies can force States and localities to land oil they do not want.

The same logic applies to southern California where there is considerable concern that additional refining operations might degrade air quality to a very serious or even dangerous level. If southern Californians do not want additional refineries in that region, they can readily block their construction.

Realistically, however, southern Californians--and possibly even New Englanders--will wish to avoid paying large transportation premiums and will permit refineries to be built. They will seek to prevent serious and adverse environmental impacts by applying air and water quality standards and land-use controls. Whether these governmental instruments are used well or poorly, however, probably depends very little on whether crude feedstocks come from abroad or from the Georges Bank OCS or from the southern California OCS or from Alaska.

To the extent that environmental controls on refinery siting increase the costs of transporting crude oil from where it is produced on the OCS to its ultimate onshore destination, they will be opposed by the relevant oil companies and by those segments of the public more interested in lower prices for petroleum products than in certain environmental values. If in such a conflict State or local political processes become biased in either direction, the public interest will not be served. Although the Department of the Interior position is basically to permit State and local political processes to work themselves out freely, without Federal interference, the Department will remain alert to these potential problems, and aid in resolution of public issues.

Even if refinery impacts are likely to be no greater (or no different) with OCS development than without it, it is still worth asking what they are likely to be and where they are likely to be felt. An important point to note is that for either OCS oil or imported crude, the amount of new "grass roots" refinery capacity will be less than the total amount of new capacity. A number of existing refineries can be expanded simply by extending existing plant and by modifying machinery and structures to incorporate new engineering concepts. This "retrofitting" capability is especially relevent to refineries in the Mid-Atlantic.

In OCS producing areas (lower 48 States) where there is no adjacent refining capacity, location of any refineries would be a function of potential pipeline corridors, availability of suitable sites, and State and local controls, as well as intraregional economic factors. In the two potential OCS production areas where no significant refineries exist, the South Atlantic and North Atlantic, these factors would probably play different roles, mainly because of the difference in local receptivity to refinery and industrial development. Although the economic advantages of accessibility to water transport impel refineries to locate in the coastal zone, it is possible to operate refineries inland, as long as an adequate supply of water is available. Since additional right-of-way and pipeline is required, and, in the case of refineries supplied by tanker, two separate facilities (refinery and terminal), it is a more expensive alternative.. In the North Atlantic, opposition to refineries has thus far outweighed the economic advantages to industry in siting refineries in that region (Table 119). Therefore, if OCS development, combined with existing pressures, stimulates refinery development in New England, one would expect State and local controls to play a much larger role in final site determinations than they have generally in other areas. On the other hand, the South Atlantic area is generally very receptive to industrial development, and economic factors may be relatively more important in siting refineries.

On the West Coast, major refinery concentrations exist in the vicinity of Puget Sound, San Francisco Bay, and Los Angeles. Presumably, most new capacity would be built in these areas, but political forces could easily dictate otherwise.

An economically viable capacity for a grassroots refinery presently in the planning stages is approaching 200,000 bbl/day. Such a refinery requires 650 acres for all refinery facilities and storage tanks. However, 1200 acres is generally regarded as the minimum requirement for a new refinery site. This allows space for expansion and buffer.

New refineries are expected to shift toward closed water systems and air cooling systems to reduce water requirements. This shift would result in a requirement of 4 million gal/day in the year 2000(CEQ---RPA analysis). Most air and water pollution loadings are not expected to present major problems for future refineries because of improved

Table 119

REFINERIES PLANNED BUT NOT CONSTRUCTED DUE TO OPPOSITION ON ENVIRONMENTAL GROUNDS

COMPANY	LOCATION	SIZE BBL/DAY	FINAL ACTION BLOCKING PROJECT
Shell Oil Co.	Delaware Bay, DE	150,000	State reacted by legislature passing bill forbidding refineries in Coastal Area.
Fuels Desulferization	Riverhead, L.I.	200,000	City Council opposed project and would not change zoning.
Maine Clean Fuels	South Portland, ME	200,000	City Council rejected proposal.
Maine Clean Fuels	Searsport, ME	200,000	Maine Environmental Protection Board rejected proposal.
Georgia Refining Co.	Brunswick, GA	200,000	Blocked through actions of Office of State Environmental Director.
Northeast Petroleum	Tiverton, RI	65,000	City Council rejected proposal.
Supermarine, Inc.	Hoboken, NJ	100,000	Hoboken Project withdrawn under pressure from environmental groups.
Commerce Oil	Jamestown Isl. Narragansett Bay	50,000	Opposed by local organizations and contested in court.
Steuart Petroleum	Piney Point, MD	100,000	Rejected by St. Mary's County voters by referendum on July 23, 1974.
Olympic Oil Refineries, Inc.	Durham, NH	400,000	Withdrawn after rejection by local referendum.
C.H.Sprague & Son	Newington, NH	50,000	Voted down in community vote on June 28, 1974.
Belcher Oil Co.	Manatee County, FL	200,000	Voted against in referendum September 10, 1974

Source: FEA, " Trends in Refinery Capacity and Utilization" p. 11 (1974) technologies for pollution control and treatment. An exception is hydrocarbon emission, which will probably continue to pose significant control problems. This is an important constraint to refinery development in areas where hydrocarbon emissions are already a problem.. Electric power requirements for refineries are estimated at 630,000 KWH/day per 100,000 bbl of oil refined (CEQ, RPA analysis).

Requirements and pollution loadings resulting from expansion of existing refineries depend on the nature of the facilities being expanded. Because of engineering advances, relatively old refineries can be expanded by retrofitting processes which would require minimal land in addition to existing sites. In many cases, such retrofitting may result in lowering of pollution loadings due to new technologies being applied. Future expansions of new refineries may, however, require additional space and result in an increase in air and water pollution. Possible expansions are taken into consideration when purchasing sites for new refineries.

A new refinery in 1985 is estimated to require about 500 employees; increases in productivity may further decrease the number required. Most employment requirements are for skilled labor. In A Preliminary Assessment of Alternative Methods of Supplying Petroleum Products to Eastern Massachusetts, Arthur D. Little predicted that 90% of the estimated employment could come from Massachusetts. In doing so, the study assumed a training program conducted by refiners in Massachusetts prior to commencing refining operations. The extent to which available local labor could or would be utilized in a new refinery would depend on the skills and nature of the existing labor force and the extent to which training would be provided for local labor.

Refinery construction would also require considerable labor. The extent to which a local boom/bust cycle in the construction industry would be created would depend on the existing construction industry as well as on the amount of increased construction stimulated by a refinery or refineries in a region.

A decision to invest in a refinery in a particular region can have extensive economic effects through successive rounds of additional spending. Increased income and employment opportunities often result from such an investment. Increased infrastructure might be added to support possible increases in population within the area. The resulting distribution of income in a particular regional economy will depend on the existing structure, the nature of the goods produced and consumed, and the nature and quantity of the existing labor force. To the extent that refinery investment stimulates growth in new and existing industries within a region, economic activity can be expected to increase.

For example, we might compare two of the East Coast cases that CEQ-RPA examined, Bristol County, Massachusetts and Cumberland and Cape May Counties, New Jersey. Bristol County is an old manufacturing center with a declining economy. Cumberland and Cape May Counties are rural with economies described as stagnant. RPA examined the impact of refinery development of .25 and .5 million bbl/day for 1985 and 2000, respectively, in Bristol County; and .35 and.5 million bbl/day, respectively, for Cumberland and Cape May Counties (High OCS case). If we compare the predicted impact of these cases with predicted base cases assuming no refinery development, we find very different levels of impact. In Bristol County, employment rises 7 to 9% and economic output 16 to 19%. In the two New Jersey counties, employment rises 20 to 30% and economic output increases 56%.

Impacts on the larger regions would be relatively smaller. Greater total refining capacity was predicted for the Delaware River region than for Eastern Massachusetts/Rhode Island, which resulted in a greater projected amount of petrochemical development. (Equal gas processing levels were predicted for both regions). However, the net regional effects on employment and economic output for both areas were estimated to be relatively small(2-3% for employment, 4-5% for economic output), and varied by only a percentage point. Because of its highly industrialized nature and the present existence of refinery and associated development, the Mid-Atlantic would be able to absorb a greater amount of refinery development without a substantial net regional increase in employment and economic output.

(2) Gas Processing 1/

There is presently a great demand for gas fuels due to the shortage of natural gas supplies which has resulted in the curtailment of gas deliveries under existing contracts. New customers are in many instances not being accepted, or are being accepted in limited numbers. The capital investment requirement for a gas processing plant (GPP) is much less than that required for a refinery; therefore, the financial constraints are considerably less. Due to smaller resource requirements of land, water and electricity, and the much smaller degree of air pollution, there has not been as much opposition to processing plants on environmental grounds.

In contrast to refineries, there is practically no doubt that OCS development in frontier areas would stimulate additional gas processing capacity if natural gas resources could be developed into economic reserves.

Natural gas once produced is usually sold to a transporter/distributor, but the oil company reserves the right to process the gas before it enters the distribution system. At a GPP, the butanes and propanes are stripped from the natural gas after the separation of oil and water has taken place. The stripping of butanes and propanes is not

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1/ The process referred to in this context is the extraction (stripping of propanes and butanes from natural gas as distinguished from the process of separating natural gas from oil and water.

necessary, but is desirable as propanes and butanes are in high demand and have high economic value.

The growth of GPP's is directly related to propane and butane components found in natural gas. If butanes and propanes are not found at all as components in the natural gas or exist in amounts too low to make extraction economic, then GPP's would not develop even if there are economic gas reserves. The lack of butanes and propanes would be the very rare exception and not the norm, however.

In a decision to site a gas processing plant, the most important factors are locating near the market, the source of production and the distribution system. In Alaska, where the market demand for butanes and propanes is low, plants would locate in the lower 48 States. Natural gas would be transported via pipeline to the market areas, processed, and trucked to their distribution points. On the Atlantic coast, where there is a high market demand and an available distribution system, but no production, significant growth of GPP's as a direct result of OCS development would be expected. In producing areas like the Gulf of Mexico where GPP's are already extensively developed, it is expected that further OCS production would replenish depleted supplies, therefore increasing capacity utilization. It may also cause an expansion of existing facilities, replacement of old equipment, in addition to the possible growth of new plants. Except for offloading facilities for liquefied natural gas

(LNG), no new GPP facilities are anticipated on the West Coast.

The precise siting of a GPP would greatly depend upon the location of pipeline corridors. Even though plants in many instances are located near the shore, such locations are not technically necessary but are economically desirable, since the amount of pipeline required is less, therefore limiting the transportation costs. The availability of water and electricity are mandatory for the operation of a GPP, although quantities needed are comparatively small. Highway and rail access is crucial to operations, as products are usually transported by truck and/or rail.

Given the overall importance of market location, producing areas, and proximity to the distribution (pipeline) system, the siting of GPP's, like that of refineries, will ultimately depend upon State and local zoning ordinances, coastal zone regulations, and air and water quality standards.

The size of gas processing plants is highly variable. They may have a capacity under 150,000 cubic feet (cf) per day to more than one or two billion cf per day. The size of the plant would greatly depend on production levels and other economic factors. The size of a plant influences investment requirements, employment, land requirements, etc. Since the expansion of processing plants does present any major difficulties, it is possible to build a small plant in the early stages of development and gradually increase the capacity as production increases.

Following are the requirements associated with two hypothetical plants, one a representative model developed by RPA, the other developed by industry sources for the Mid-Atlantic. The third facility described is an existing plant in the Gulf of Mexico area. It is merely used here as an example and is not to be considered typical or representative. It is probably atypical in that it is a relatively small plant.

Table 126

Source	Capacity (mmcf/day)	Employees	Wages	Land (acres)
RPA[1] Vol. 4 Appendix III	500	55	$10,000 (1970)	20
Industry	300	21	$12,680-15,300 (1974)	75
Industry (existing)	150	10	$14,264 (1975)	7-8

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[1] The RPA plant also has an estimated daily water usage of 15,000 gal. and an electricity usage of 1800 kwh.

e. Two studies of costs and benefits to governments in coastal States.

The economic costs and benefits of OCS development to the State and local Governments in coastal States is an issue of particular concern in frontier areas. The benefits of OCS development, such as increased employment and incomes, must be weighed against the need to expand government services and facilities. Two studies which have addressed this question within the context of the Gulf of Mexico experience are:

1. Benefits and Costs to State and Local Governments in Texas Resulting from Offshore Petroleum Leases on Federal Lands, prepared by the Management Science Division, Office of Information Services, Office of the Governor of Texas, Report 0025-029-1174-NR, November 1974.

2. Offshore Revenue Sharing: An Analysis of Offshore Operations on Coastal States, prepared by Gulf South Research Institute, Baton Rouge, Louisiana, for the Governor's Offshore Revenue Sharing Committee, GSRI Project No. XS-614.

The first study indicates that Texas state and local governments will receive revenues from OCS activities of $48.9 million a year and will spend $111 million a year in services to OCS related population. Thus, the net cost to state and local government will be $62.1 million a year.

The second study indicates that OCS-related employment is about 124,400 persons, expenditures by state and local government for services to these persons and their families are $265 million a year, and of this, net cost to state and local government is $38 million a year.

The methodology of the Texas study is questionable on several counts. First, it treats costs of government services to residents employed in a particular industry (in this case, jobs related to OCS production), as costs to the government of that industry operating in the state. There is no accepted theory of public finance which requires that an industry contribute tax revenues proportionate to the number of employees, to cover the cost of government services to these employees and their families in their capacity as private citizens. If the methodology of the study were extended to other industries, it would seem that, with the exception of onshore and state offshore petroleum production, all industries, not only federal offshore petroleum-related industries, impose net costs on Texas governments.

The figures for state and local government revenues related to federal offshore production appear too low. The derivation of these figures is not given. The explanation that "State and local government revenues will result from indirect effects on the Texas economy" (p. 7) leaves open to question the definition of direct and indirect effects, and how these were treated in deriving the revenue estimates.

Texas has a unique tax structure. There is no personal or corporate income tax (there is a corporate franchise tax); property taxes are significant only on a local level and are the primary support for the school system. Within this tax structure, the petroleum industry as a whole contributes a disproportionately large share of government revenues compared to other industries. According to an industry association booklet , the Texas petroleum industry employs some 230,000 persons, about one out of every eighteen Texas workers, with wages of $2.3 billion a year; pays taxes to the State Government of $383 million, about 14.8% of all State taxes; pays 22.4% of State franchise taxes and 26.2% of State property taxes.* In the year ended August 31, 1974, highway motor fuel taxes contributed 7.80 cents of each dollar of net State receipts, the production and regulation tax on crude oil contributed 6.94 cents, and the production and regulation tax on natural and casinghead gas contributed 3.47 cents.**

The second study, Offshore Revenue Sharing, evaluates the revenues and costs of OCS activity to Louisiana state and local governments, and then by analogy, to other coastal states. The methodology used is similar to that of the Texas study and is questionable on the same counts. The OCS-related employment figures used to calculate costs of government services appear too high. The per capita expenditure by state and local government includes a federal contribution of about 20%, resulting in overstatement of state and local expenditures by $138 per capita. This factor alone would change the net loss of $38 million to a net gain of $16 million.

Further, the net loss figure associated with OCS activities is based on a questionable set of assumptions concerning what percent of the corporate share of the costs of government services to OCS-related employees, is uncompensated within each sector. For example, one assumption is that fifty percent of the cost of governmental services provided manufacturing firms serving the OCS are uncompensated. The explanation of these assumptions is obscure.

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* 74 Facts about Texas Oil and Gas, the Texas Mid-Continent Oil and Gas Association.

** Annual Report of the Comptroller of Public Accounts, State of Texas, to the Governor, 1974.

The study estimates employment, population, and cost of government services for the Atlantic, Pacific, and Gulf of Mexico regions using employment and population multipliers and cost of government services from Louisiana. These multipliers are inappropriate for frontier areas, which generally lack significant onshore oil and gas development. Should it occur, onshore development could follow patterns very different from Louisiana. Also, the finding and drilling rates used in the calculatinns are too simplified to provide meaningful results.

Socio-economic impacts can be roughly differentiated across some areas. The heavily industrialized middle Atlantic area would probably feel little impact of development in that area from increased population, income, industrial activity, etc. At greater distances from the middle Atlantic, the impacts of new industry, particularly refineries would be felt to a larger degree.

An analogous situation is found on the Gulf Coast. The central Gulf is one of heavy industrial activity and large population, both of which generally decrease either to the east or the west. On both the Atlantic and Gulf coasts, OCS development induced impacts would probably not affect existing community infrastructure and regional economics in an extremely noticeable manner.

Industrial activity and population on the West Coast ranges from rather high in Southern California to a low level as one moves north and on to a more moderate level in Washington. Oil and gas development could cause socio-economic problems in the middle area between Washington and Southern California.

The State of Alaska is probably the most ill-equipped region to handle the pressures of OCS development. Many of the coastal communities are fishing and/or subsistence hunting villages, and would probably be disrupted in many ways by shoreside activities. Existing rail, road, air and shipping systems would be severely strained, if not inundated by large scale OCS development. However, a long lead time will be necessary for Alaskan development, time in which to begin preparing for these impacts if a decision is made to proceed with such development.

A more complete discussion of generic socio-economic impacts is given in the next section.

2. Impacts on Aesthetic and Scenic Values

If air quality permits unlimited visibility, some portion of a one hundred foot structure can be seen from the beach if it is located 17 miles or less from shore. Some people consider the sight of offshore equipment aesthetically unpleasant.

Any floating material such as debris or oil that is cast up on the beach or washed into a bay would constitute an impact upon the aesthetic values for users or owners of the area.

Even after burial of the pipeline, the scars will cause an impact on the aesthetic values of the beach and associated dunes and sand flats. It is our estimation that the impact will endure for at least a year, until sand has been redistributed by wind, and tides, and another growing season brings about revegetation.

Revegetation of dunes crossed by pipelines would reduce adverse effects from an aesthetic and scenic viewpoint and would decrease the chance of destruction of the dunes by erosion. It is not, however, within the Federal Government's authority to require the revegetation of affected dunes unless they are on Federal lands. State or local authorities may require revegetation of dunes disrupted by pipeline installations.

There will be an adverse impact on aesthetic and scenic values resulting from construction of onshore terminal and product storage facilities, and pumping stations if these facilities are located in areas valued for their natural or scenic qualities. Some peiple will find the visual impact of these facilities aesthetically displeasing. There also may be noise pollution associated with vehicular traffic to and from these facilities and noise pollution resulting from pumping stations that would reduce the serene and natural qualities of aesthetically enjoyable area. In certain areas, particularly Southern California, there may be an impact on ocean-view property values.

3. Impact on Air Quality

The quality of air in any area could be degraded by exhaust emissions of stationary power units and service vessels, and by the accidental release of oil and gas from wild wells.

The impact of exhaust emissions is unknown, but considering the small total horsepower requirements it is thought to be small.

The average composition of natural gas as delivered to pipelines in the United States is:

Methane	CH_4	72.3%
Ethane	C_2H_6	14.4%
Carbon dioxide	CO_2	0.5%
Nitrogen	N_2	12.8%

(Small amounts of sulphur and other materials could also be present in some localities) (source: Ley, 1935)

If a wild well were not burning, obviously, the above gases would simply be released into the air. If the gas well was on fire, combustion would be essentially complete and the emissions would consist almost entirely of carbon dioxide (CO_2) and water; the nitrogen would remain as N_2 and any sulfurous gases would be oxidized to SO_2. The resulting impact would not be great.

If a wild well were releasing crude oil into the water, the resulting impact would be substantially greater. If the oil does not burn, a significant amount of it will evaporate. During the Chevron, 1970 spill it was estimated that 15% of the roughly 30,000 bbl. spilled evaporated. At an average density of 310 lb./bbl., this incident would have introduced almost 14,000 lb. of hydrocarbons into the air. Some oil spills in the past have resulted in fires.

A reasonable estimate of the range of emissions, assuming complete combustion, that an oil well fire could produce per 1,000 bbl. burned, might be as follows: [1]

CO_2 : 340,000-347,000 lb.
SO_2 : 620-34,000 lb. [2]
NO : 660-10,000 lb.

(As a point of reference, during the Chevron - 1970 fire and spill, the maximum spillage rate was estimated to be 1,000 bbl. per day.)

Combustion of oil would in reality be incomplete, however, and emission would contain somewhat less of the above compounds, but would include, in addition, such materials as volatilized petroleum, particulate carbon, carbon monoxide, nitrous oxide, sulphur monoxide, along with other altered or partially oxidized matter. There is no reliable way to predict in advance the relative volumes of each of these possible emissions because it would depend, among other things, upon moisture content of the air, wind speed, pattern of oil spray from wild wells, number of wells involved, chemical content and physical character of the oil itself, and types of equipment and materials other than oil that might also burn.

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[1] Values used in calculation are based on world averages for crude oil of 310 lb/bbl.; Percent content by weight is: carbon 82.2 to 97.1, sulfur 0.1 to 5.5, nitrogen 0.1 to 1.5 (Levorsen, 1958).

[2] SO_2 emission would be less for Gulf of Mexico crudes, which range from 0.1 to 0.5% sulfur.

As previously discussed, an increase in refinery capacity will add to the total emissions of oxides of nitrogen, sulphur dioxide, hydrocarbons, carbon monoxide, and hydrogen sulfide, particularly to the atmosphere. An increase in refinery capacity and other petrochemical industries to process all the increased production resulting from this proposal would cause a substantial increase in emissions. Oil produced as a result of this proposal, however, may not necessarily create the need for increased refinery capacity and other petrochemical industries; it may replace oil that otherwise would be imported or it may take the place of oil that will not be furnished from domestic sources due to declining production or other factors.

4. Impact on Water Quality

The natural condition of sea water may be altered and degraded in several ways during oil and gas operations.

Debris and bilge will be released into OCS waters from the many seismic vessels, crew boats, tugs, and service and supply boats used throughout operations. No estimate can be made of the quantities involved.

During drilling operations, drilling fluids and drill cuttings will be discharged into the sea. Most drill cuttings in the OCS will consist of sand and shales and therefore cause no turbidity, but settle to the bottom quite rapidly, on the order of minutes. The drill cuttings are washed prior to disposal.

It has been estimated that 1,700 barrels of cuttings and as much as 300 tons of turbidity-producing mud compounds are discharged overboard during the course of drilling an average 10,000 foot well.

Three components or properties of formation waters contribute to water quality degradation when released into the sea. One is the small amount of entrained liquid hydrocarbon. There are some locations disposing of formation water where the treatement equipment puts out an effluent with less than 25 ppm oil content; control is not being accomplished across the board on a continuing basis. Many other locations only manage to meet the requirements of OCS Order No. 8, releasing waters with entrained oil averaging less than 50 ppm. The second property of formation water that degrades water quality is its high concentration of dissolved mineral salts. This value ranged from 61,552 mg/1 to 270,000 mg/1 in 76 samples from the OCS off Louisiana. This contrasts sharply to the average sea water salinity of 35,000 mg/l. The third degrading property results from the fact that formation waters are devoid of dissolved oxygen. Current production of formation waters from all Louisiana OCS operations is 605,000 bbl./day; 305,000 bbl./day is transported to shore.

Water quality could be further degraded as the result of accidental oil spills, but the degree of degradation is impossible to predict. Part of this spilled oil would be removed by clean-up operation and some would evaporate, but the largest proportion would probably be dispersed into the ocean waters.

Another source of water quality degradation is the resuspension of sediment during pipeline construction and burial. The jetting away of the substrate from beneath the pipeline will result in creating a plume of trubidity trailing away from the operations in the direction of the current. The plume can reach proportions of several yards wide and hundreds of yards long if the substrate is exceptionally muddy. The duration appears to be on the order of several hours at a given location.

Water quality is sometimes affected by effluents from oil refineries and petrochemical plants. Although production from this proposal will probably not require an expansion of refinery capacity nation-wide, it will be refined in the area along with production from other non-OCS sources. In this manner, production from this proposal will contribute to the continuation of refining activity in various regions and its resultant effects on water quality. Effluent discharges could increase the total dissolved water quality. Effluent discharges could increase the total dissolved solids, oil, and biological oxygen demand; these discharges, however, must meet existing local, State, and Federal anti-pollution standards.

5. Historical or Archeological Sites and Objects

Impacts on these could stem from two sources. During an oil spill, any objects coated with oil would obviously be rendered less useful and valuable and may not survive cleaning operations. In addition, porous items such as wood, pottery, or shell may be internally contaminated with oil and this might interfere with carbon dating procedures.

During pipeline burial operations or construction of terminal, storage, or pumping facilities, as yet undiscovered archeological sites or objects and shipwrecks may be damaged or destroyed. Normal pipeline route survey procedures usually include a magnetometer survey. In this way, all larger ferrous objects, including objects of historic or archeological value, are detected and avoided or investigated prior to actual laying operations. This survey would not reveal the presence of nonferrous objects, however. Therefore, it is likely that sites containing archeological evidence of cultures which did not make use of metal, i.e., the older, less well-known cultures, would not be detected by this method.

Special surveys of onshore facility site locations and pipeline routes would have to be taken before any assurance that sites and objects of historical or archeological interest might not be destroyed or damaged.

Pipeline burial operations have the potential for damage or accidental destruction of as yet undiscovered sites which may be important to the understanding of prehistoric inhabitants of the area. The scope of the impact and its probability of occurrence is not possible to determine at this time. The impact may be mitigated to some degree if the appropriate state authorities are consulted as to the exact locations of known archeological sites or potential locations for undiscovered sites before any construction or pipeline burial is undertaken.

6. Impact on Ship Traffic and Navigation

In many areas of the United States OCS safety fairways have been established for safe passage of vessels enroute to, or from U. S. ports. Consequently, placements of rigs or platforms are prohibited within these fairways. Ships especially foreign ships, do not always use these fairways, however, and this increases the possibility of a collission with drilling rigs, permanent platforms or vessels attending these platforms. Impacts which could result include loss of human life, spill of oil, release of debris including part of, or the entire drilling rigs, and the ship, if it sinks. The contents of the ship's cargo could pose a serious threat to the environment if it includes toxic materials such as chemicals, crude oil, or refinery products. Statistics on ship-platform collisions in the Gulf of Mexico are given in Tables

A marine casualty is any casualty involving a vessel other than a public vessel if such casuality occurs upon the navigable waters of the United States, its territories or possessions, or any casualty involving a United States vessel wherever the casualty may occur. Casualties involving commercial vessels are required to be reported to the Coast Guard whenever the casualty results in any of the following: (a) actual physical damage to property in excess of $1,500; (b) material damage affecting the seaworthiness or efficiency of a vessel; (c) stranding or grounding; (d) loss of life; or (3) injury causing any person to remain incapacitated for a period in excess of 72 hours;

except injury to harbor workers not resulting in death and not resulting from vessel casualty or vessel equipment casualty.

Table120 is a summary of reported collisions between large vessels and offshore structures in the Gulf of Mexico. The eight cases cover the period 1 July 1962 through 30 June 1973 and include only those collisions involving vessels over 1000 gross tons. When location is known, the latitude and longitude of the platform is given. Twenty-two other collisions with fixed structures were reported during this eleven year period and are summarized in Table 121. Fifteen accidents involving vessels less than 100 gross tons and the remaining seven vessels were between 100 and 650 gross tons. In all cases, there was no loss of life involved and damage to the rig was insignificant.

Figure 104 shows the increase in the number of offshore structures versus the small number of accidents involving these platforms in the Gulf of Mexico. It should be noted that the number of accidents involving structures is not increasing while the number of structures is increasing at a phenomenal rate. The accidents involving small vessels (Table121) might in some cases be considered self-generating; that is, the fishing vessels could have been near the rigs due to the improved fishing around the structures and the barges, cargo vessels and passenger vessels could in some cases have been servicing the platforms.

TABLE 120. MAJOR COLLISIONS WITH LARGE OFFSHORE STRUCTURES, FY 63-73

NAME	TYPE	DATE/TIME/INCIDENT/CAUSE	WEATHER CONDITIONS
GANGES (British)	Cargo	9 Nov 63, night - Collision in Gulf of Mexico - $5,000 damage.	Overcast, visibility over 2 miles, wind 30 lts. seas ;5=2- ft/
PHILLIPS PLATFORM 115-3	Fixed Structure	$300,000 Damage CAUSE - PERSONNEL FAULT	
DAUPHIN (O.N. 254298)	Towboat	4 May 64, day - Collision in Gulf of Mexico.	Partly cloudy, visibility over 2 miles, wind 20 kts, seas 5 ft.
AIPLE #50 (O.N. 276123)	Cargo barge		
UNKNOWN	Fixed Structure	CAUSE - PERSONNEL FAULT $180,000 Damage	
GENERAL ARTIGAS (Argentine)	Cargo	15 Dec 65, day - Collision in Gulf of Mexico.	Unknown
SHELL-PHILLIPS FEDERAL BLOCK 135		CAUSE UNDETERMINED $200,000 Damage	
SUPERIOR 103-1	Fixed Structure	12 Sep 67, 2130 - Damaged by Collision with unidentified vessel. L29°16'16.74"N 92°22'13.1"W $100,000 Damage	Unknown
M/S EMMA JOHANNA (German)	Cargo	30 Oct 67, 0130 - Collision in Gulf of Mexico. L28°29'36.158"N 90°51'25.54"W	Heavy rain, poor visibility wind SE 45 kts, seas SE 15-20 ft.
KERR McGEE OIL PLATFORM OCS	Fixed Structure	$12,000 Damage CAUSE - PERSONNEL FAULT $1,100,000 Damage	
M/V OLYMPIC FLAME (Liberian)	Tankship	10 Oct 70, 2200 - Collision in Gulf of Mexico. $60,000 Damage L28°41'17"N 91°46'20"W	Clear, visibility 5 mi., wind E 7 kts, slight sea.
PLACID OIL CO. PLATFORM 202-1	Fixed Structure	$865,000 Damage CAUSE - PERSONNEL FAULT	
KIMON		4 OCT 65 - Collision in Gulf of Mexico	Unknown
CONTINENTAL OIL PLATFORM D - BLOCK 47	Fixed Structure	CAUSE UNKNOWN	
ESSEX	Cargo	27 AUG 69, 2340 - Collision in Gulf of Mexico- $10,000	Overcast, visibility 18 miles, wind S 5 LTS gusting, moderate sea slight swell (SE-2 ft.)
HUMBLE OIL OFFSHORE STRUCTURE #142-2	Fixed Structure	L29° 06' 19" N 94° 23' 47" W $500,000 Damage CAUSE - PERSONNEL FAULT	

Vessel Type

A.Fishing Vesse

B.Barge

C.Small Cargo
Vessel

D.Passenger
Vessel

A.1. Feb. 66
2. June 66
3. May 67
4. June 67
5. Oct. 67
6. Nov. 67
7. May 70
8. June 70
9. Nov. 71
10. Dec. 71

TABLE 121. COLLISIONS WITH OFFSHORE STRUCTURES
FY 63-73 (Vessels less than 1000 G.T.)

Type	Total Number	CAUSE Adverse Weather	Personnel Fault	Equipment Failure	Fault of Rig	TOTAL DAMAGE (Thousands of Dollars) Vessel	Rig	# of People Injured
g Vessel	10		5	1	4 [a]	151 [e]	24	1
	2	1		1		35	68	0
Cargo	8	3	4		1[b]	221[d]	10	2
ger	2			1	1[c]	19	0	1

Dates of Accidents

b. 66	B.1. Dec. 65	C.1. Dec. 65	D.1. Feb. 70
ne 66	2. Dec. 65	2. Dec. 66	2. Feb. 70
y 67		3. July 67	
ne 67		4. May 70	
t. 67		5. July 71	
v. 67		6. Sept. 71	
y 70		7. Sept. 71	
ne 70		8. Nov. 71	
v. 71			
c. 71			

[a] Three equipment failures, 1 insufficient/improper lighting

[b] Improper maintenance

[c] Insufficient/improper lighting

[d] Includes $130,000 to one vessel

[e] Include 80,000 to one vessel that sunk

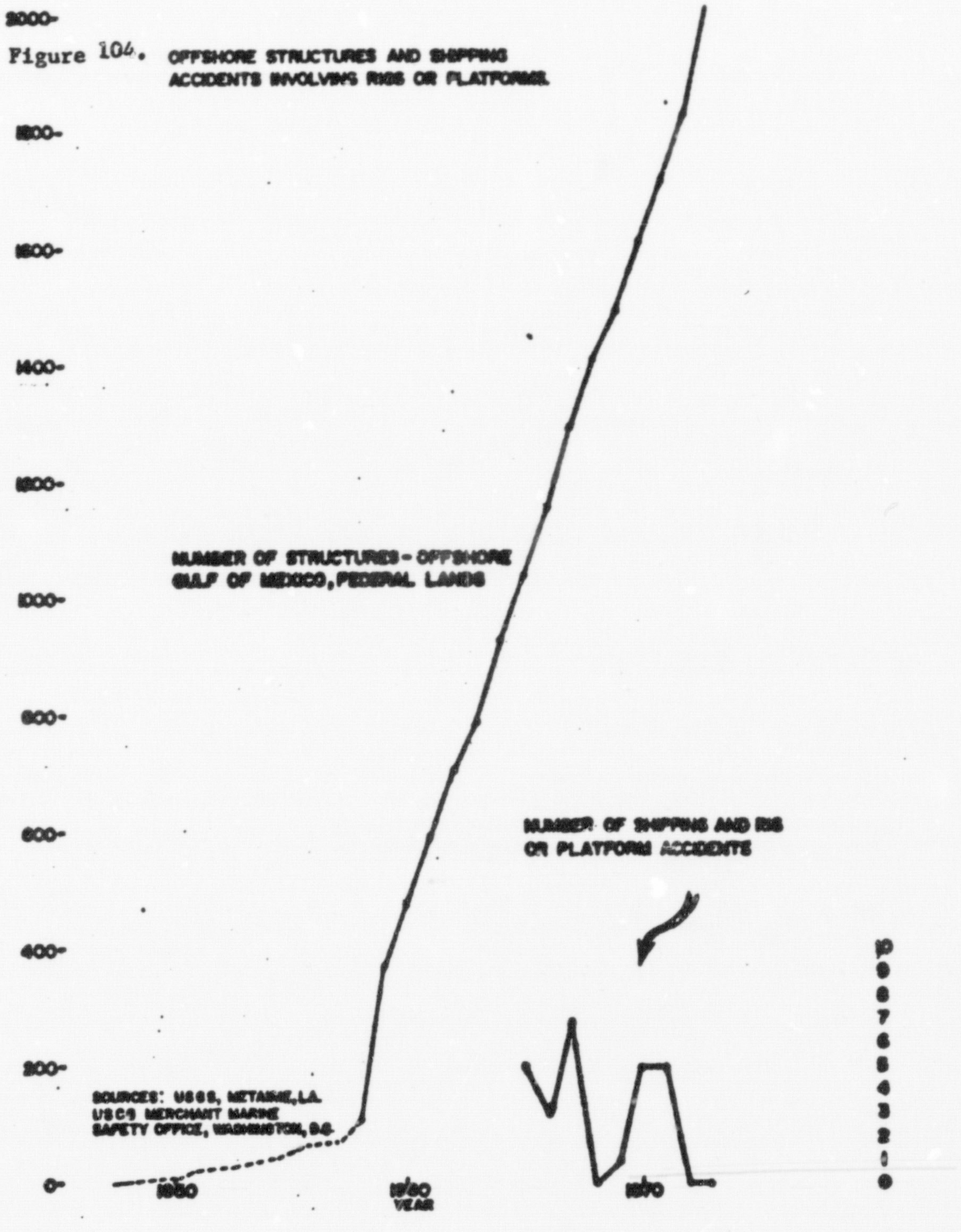


Figure 104. OFFSHORE STRUCTURES AND SHIPPING ACCIDENTS INVOLVING RIGS OR PLATFORMS.

SOURCES: USGS, METAIRIE, LA. USCG MERCHANT MARINE SAFETY OFFICE, WASHINGTON, D.C.

The most serious environmental hazard involving offshore structures and shipping accidents would occur in the case of an oil tanker ramming a platform. In this theoretical case supertankers might be considered in a more favorable light than small tankers if the following were the case:

1. The offshore terminal buoy process was used. These are know as offshore deepwater terminals or "Superports". One terminal is planned for offshore Freeport-Galveston and another is planned for offshore Corpus Christi
2. The fairway, the area near the fairway, and the area around the terminal buoy had no nearby bathymetric hazards, or these hazards were carefully surveyed and marked.
3. The supertankers were kept in the fairways in the area of offshore structures.
4. The supertanker traffic was restricted to one way traffic in the fairways so tankers were never on head-on courses.

Supertankers and deep water buoyed terminals would decrease the traffic created by the small tankers presently in use. The fewer number of tankers and the higher care in the moving of supertankers would appear to decrease the probability of tanker-platform related accidents.

Very little interference with navigation is to be expected between drilling rigs and platforms and ships that are utilizing established fairways. However, at night, and especially during rough weather, fog, and heavy seas, ships not navigating the fairways could collide with fixed structures. Also fishing boats engaged in trawling will be inconvenienced by having to navigate around fixed structures located on fishing grounds.

H. Resources Summary and Oil Spill Risk Summary

The following table (Table 122) is a compilation of the various significant resources found in the different OCS areas. The table is derived from the Fish and Wildlife Service descriptive material presented at the end of Section II. This material is presented here so that comparisons can be made with the oil spill risk summary which follows. Section III.F. outlined the reasoning why these resources were not evaluated and compared to produce a summary ranking. Since such a subjective approach was not used, comparisons of resources with the risk analysis which follows can also not be made. When the relative risks of development are portrayed, the reader can make personal judgment about the resource values in high, moderate, and low risk areas. This table needs no explanation except that the recreation and ports and shipping information was derived for portions of Section II apart from the Fish and Wildlife Service material.

TABLE 122. AREA BY AREA SUMMARY OF SIGNIFICANT AND POTENTIALLY VULNERABLE RESOURCES

OCS AREA	WILDLIFE RESOURCES			UNIQUE & HIGHLY PRODUCTIVE AREAS		FISHERY RESOURCES 1/		AESTHETIC & RECREATION RESOURCES
	birds	marine mammals	other	estuaries	refuge/management areas	commercial	recreational	
North Atlantic	300,000 waterfowl 3.5 to 4 million coastal and seabirds			70% commercially important species use for spawning, nursery, or feeding	56 Govermental areas	1.9 billion pounds; value $116 million	1.7 million salt water anglers harvested 267 million pounds	All Northeast total recreation days 735,000,000 Swimming--primary; Boating (fishing)--secondary
Mid-Atlantic	836,000 waterfowl Over 5 million coastal and seabirds			Large areas and very important to shellfish and waterfowl	Nearly 100	970 million pounds, value $85 million	1.8 million salt water anglers harvested 246 million pounds	
South Atlantic	867,000 waterfowl. Important bird habitat areas		Various turtles nest on beaches. Several endangered species of turtles	Some 2,650 miles of estuarine and beaches - almost a continuous estuary	17 including some 1.5 million acres	220 million pounds; value $54 million	1.9 million salt water anglers harvested 404 million pounds	493,000,000 Recreation days; Swimming primary (most is S. Fla., no drilling)
East & Central Gulf of Mexico	3.4 million waterfowl Louisiana alone; other birds abundant but numbers not known	Florida manatee endangered; bottlenose dolphin most common	Several species of turtles occur including endangered species American Aligator endangered common in coastal areas	6.3 million acres of open water estuaries plus over 2.5 million acres of tidal marsh Upwards of 90% of commercial fish catch estuarine dependent	5, totaling over 200,000 acres in Louisiana, Florida 13 Federal areas; 30 State; 3 national parks	100 million pounds; value over $60 million	1.55 million salt water anglers harvested 334 million pounds	Highly used for sportfishing Beaches less prevalent except parts of Florida Panhandle and Galveston (heavy use) Heavy hunting in marshes

TABLE 122 (cont') AREA BY AREA SUMMARY OF SIGNIFICANT AND POTENTIALLY VUNERABLE RESOURCES

OCS AREA	WILDLIFE RESOURCES			UNIQUE & HIGHLY PRODUCTIVE AREAS		FISHERY RESOURCES 1/		AESTHETIC & RECREATION RESOURCES
	birds	marine mammals	other	estuaries	refuge/management areas	commercial	recreational	
West Gulf	400,000 geese .7 to 1.8 million ducks 150,000 coots small breeding population; brown pelican endangered		Marine turtles some endangered occur; American Aligator endangered common	1.8 million acres; 150,000 acres of oyster reefs. Over 90% of commercial catch estuarine dependent	5 Federal areas totaling 134,000 acres	107 million pounds value $88 million mostly shrimp and oysters	818,000 salt water anglers harvested 151.6 million pounds	873,000 visitors Camping, swimming, sportfishing
Southern California	50,000 water fowl winter 180 species of waterfowl	Abundant; 30 species present	Several species of marine turtles occur Important kelp harvest	8,500 acres remain over 90% of original estuaries and wetlands developed 13 areas	Few in number and small in size	161 million pounds valued at $1.6 million; 10 million pounds shellfish valued at $.9 million	Important party boat fishing 4.7 million angler days a year	All California 127,000,000 recreation days at beach only
Santa Barbara	See Southern California for numbers Channel Islands only nesting areas for many seabirds	large populations of many species 100,000 whales porpoises and sea lions inhabit area	kelp beds 130,000 tons harvested	Few in number and small in size	Channel Island National Monument	30 million pounds valued at $1.9 million shellfish 8.4 million pounds valued at $.8 million	32 party boats carried 59,500 anglers, shore fishing also important	7,000,000 visitors to State-run beaches alone much high-value ocean view property
Northern & Central California	300,000 wintered in coastal counties	sea lions, seals sea otter, propoises and whales		100,000 acres remain over 70% of original lost to development	16 Federal & State parks, one national seashore	71 million pounds valued at $14 million 13.8 million pounds shellfish valued at $4 million	little data except for salmon fishery	

TABLE 122 (cont') AREA BY AREA SUMMARY OF SIGNIFICANT AND POTENTIALLY VUNERABLE RESOURCES

OCS AREA	WILDLIFE RESOURCES			UNIQUE, HIGHLY PRODUCTIVE AREAS		FISHERY RESOURCES		AESTHETIC & RECREATION RESOURCES
	birds	marine mammals	other	estuaries	refuge/management areas	commercial	recreational	
Washington & Oregon	10 million ducks, 1 million geese use the flyway, 100,000 waterfowl wintered; hundreds of thousands of colonial sea birds, 480,000 annual seabird production	Seals, sea lions one sea otter area, whales	Kelp beds important habitat subtidal rocks and banks	Oregon 14 totaling 56,000 acres Washington 2 large areas, Willapa Bay and Grays Harbor, Puget Sound 1.6 million surface acres	Oregon Islands National Wildlife Refuge - 29 islands totaling 367 acres, other areas as well	168 million pounds valued at $36 million salmon. 46 million pounds shellfish valued at $12.7 million	Poor data, salmon most important with 1.7 million fish taken, clamming & crabbing also important	170,000,000 visitors Camping, boating, fishing, swimming
Gulf of Alaska	Very important water fowl area millions of waterfowl 10's of millions of other birds - many endangered species	Sea otters 5,000 Sea lions 46,000 harbor seals 15,000 to 20,000 northern fur seal 50,000 during spring migration 20 species of cetacean		Extensive, complex and important to commercial fisheries, birds, marine mammals and other wildlife	Three areas in southeast area	152 million pounds valued at $39 million; shellfish 29 million pounds valued at $5 million	NOT DISCUSSED	5,500,000 recreation visits for Gulf of Alaska and Cook Inlet
Cook Inlet	Very important area counts of populations not provide for entire area	1,000 sea otter 1,000 harbor seal, 10,000 sea lions, 400 beluga whales	Coastal areas support moderate populations of bald eagles and peregrine falcons	All of Cook Inlet is an estuary	Tuxedni and the Kenai National Moose Range	21.5 million pounds of salmon, 7.2 million pounds shellfish valued at $5 million	Intensively utilized by residents of Anchorage	

TABLE 122 (cont') AREA BY AREA SUMMARY OF SIGNIFICANT AND POTENTIALLY VULNERABLE RESOURCES

OCS AREA	WILDLIFE RESOURCES			UNIQUE & HIGHLY PRODUCTIVE AREAS		FISHERY RESOURCES		AESTHETIC & RECREATION RESOURCES
	birds	marine mammals	other	estuaries	refuge/management areas	commercial	recreational	
Southern Aleutian Shelf (Kodiak)	Not within a major water fowl flyway 200,000 wintering waterfowl Adequate sea bird data not available	4,000 sea otters 37,000 sea lions 15,000 harbor seals	Kodiak Brown bear	NOT DISCUSSED	5 national wildlife refuges totalling 4,8 million acres	113 million pounds valued at $29 million of crab, shrimp, and salmon other bottom fish also abundant	NOT DISCUSSED	900,000 recreation visits
Bristol Bay & Bering Sea Shelf	One of the great bird concentration complexes of the world. Tens of millions of seabirds millions of waterfowl. A major portion or the entire population of many species St. George Island 3x107 least auklets	Pribilof Islands fur sea hurd of about 1.5 million; Stella sea lions over 35,000, harbor seals 10,000 to 20,000; walrus 15.7 to 34.4 thousands several species of whales	The waters of Bristol Bay constitute one of the most biologically productive areas in the world. Nunivak Island only muskox herd in the U.S.	Izembek Lagoon millions of birds	7 national wildlife refuge totalling 4.6 million acres	Billions of pounds in foreign fisheries-Bristol Bay salmon, 50 million fish worth $20 million. Also fur seal harvest	Some sport fishing for salmon, trout and grayling	All northwest

TABLE 122 (cont') AREA BY AREA SUMMARY OF SIGNIFICANT AND POTENTIALLY VULNERABLE RESOURCES

OCS AREA	WILDLIFE RESOURCES			UNIQUE & HIGHLY PRODUCTIVE AREAS		FISHERY RESOURCES		AESTHETIC & RECREATION RESOURCES
	birds	marine mammals	other	estuaries	refuge/management areas	commercial	recreational	
Bering Sea (Norton Basin)	Important migratory bird habitat. Seward Peninsula breeding population of 231,000 ducks, whistling swans, taverner's geese emperor and crackling geese	Numerous species of walrus, several kinds of seals and whales, 1.5 million full time residents		NOT DISCUSSED	Clarence Rhode National Wildlife Refuge only one mentioned	Commercial salmon plus important subsistance fishery 8.8 million pounds of which 5 million pounds was sold for $627,000	Variety of sports fishing fly-in sports fishing	600,000 recreation visits
Chukchi and Beaufort Seas	Approximately 171 species utilize the Alaskan north coast over 11 million birds have been estimated	Seasonal entrants polar bears walrus	Arctic marine environments	NOT DISCUSSED	Chukchi Sea National Wildlife Refuge 65,000 acres; Arctic National Wildlife Refuge 8.9 million acres	Little, few species restricted distribution and slow growing Subsistance fishing more important	Little	

1/ Harvest and value are per annum

The following table (Table 123) represents an oil spill risk summary. It was derived from information developed earlier in this section on oil spill potential (based on historical spill rates), proximity to highly valued coastal features, and natural hazards to development. An explanation of methodology follows Table 123.

The risk summary in this concluding section is carried over into Section VIII, where it is used to construct several alternative leasing sequences based on different perceived leasing strategies. The cautious reader will take the time to read the assumptions and basic methodology used in creating Table 123.

Table 123. Oil Spill Risks Summary by OCS Region

	(a)	(b)	(c)	(d)	(e)	Potential Significant Spillage Thousand bbl/Year			
	Proximity	Mean Spill Rate	High Spill Rate	Low Adjustment Factor	High Adjustment Factor	(axbxd)	(axbxe)	(axcxd)	(axcxe)
North Atlantic	.1	4005	6357	1.2	1.5	0	1	1	1
Mid Atlantic	.1	6408	11696	1.2	1.5	1	1	1	1
South Atlantic	.5	1780	3856	1.2	1.5	1	1	2	3
MAFLA	.3	4450	6865	1.0	1.0	1	1	2	2
MAFLA Deep	.1	5850	10139	1.0	1.0	1	1	1	1
Central Gulf of So. Texas	.3	11273	14240	1.0	1.0	3	3	4	4
Central Gulf & So. Texas Deep	.1	8424	12704	1.0	1.0	1	1	1	1
So. California	.9	3916	5340	1.2	1.5	4	5	6	7
So. California Deep	.5	11232	19389	1.4	2.0	8	11	14	19
Santa Barbara	.9	5340	7628	1.2	1.5	6	7	8	10
Santa Barbara Deep	.9	8424	14040	1.4	2.0	11	15	18	25
No. California	.9	2374	2374	1.2	1.5	3	3	3	3
Wash. - Oregon	.8	1186	2076	1.0	1.0	1	1	2	2
Cook Inlet	.9	11952	17074	1.4	2.0	15	22	22	31
Gulf of Alaska	.7	14940	33438	1.5	5.0	16	52	35	117
Aleutian Shelf	.5	1661	1992	1.5	5.0	1	4	1	5
Bristol Bay	.5	8715	17074	1.4	2.0	6	9	12	17
Bering Sea	.3	21912	43575	1.4	2.0	9	13	18	26
Chukchi Sea	.6	53120	90263	1.5	5.0	48	159	81	271
Beaufort Sea	.9	27390	47310	1.5	5.0	37	123	64	213

ficant

ar

(axcxd)	(axcxe)
1	1
1	1
2	3
2	2
1	1
4	4
1	1
6	7
14	19
8	10
18	25
3	3
2	2
22	31
35	117
1	5
12	17
18	26
81	271
64	213

Explanation of Table 123

Table 123 displays the potential environmentally significant oil spillage from the entire OCS by region. More precisely, it displays a range of possible spillage figures, each of which is associated with a different set of assumptions about future conditions. Table 123 essentially brings together three pieces of information already presented: projected oil spill figures by region based on historically derived spillage rates per barrel throughput (Table 111); natural hazards by region (Table 117); and proximity to valuable land-based resources (Table 118). In addition, Table 123 attempts to quantify certain information previously stated only in qualitative terms, i.e., proximity and natural hazards.

The logic of combining these dimensions is simple. In the light of the analysis of natural hazards in the frontier area, it was thought desirable to adjust the historical throughput rates by multiplying with a range of adjustment coefficients (columns d and e). The derived spillage figures are then multiplied by the proximity scores in column a, which are in effect probability coefficients estimating the likelihood of spilled oil beaching and striking environmentally significant resources. For example, in the South Atlantic region, the amount of spilled oil which might be expected by extrapolating from historical OCS experience is either 1780 or 3856 barrels per year, depending on whether one assumes the mean or the maximum (5% probable) oil field discovery and subsequent production. (The figures are reproduced directly from Table 111.) In Table 120 these figures are in effect, adjusted upwards by 20% and by 50% to reflect the assumptions that frontier area production is likely to be somewhat more hazardous than production in the Gulf of Mexico; they are then multiplied by .5 to reflect the assumption that spilled oil has only a 50-50 chance of reaching shore.

An important omission from this table is the fact that certain resources which might suffer adverse impacts from discharged oil can be other than on or near the shore. The proximity scores do not incorporate these facts, which are particularly important for the Bering Sea region, where seabirds are abundant, and the North Atlantic, where large commercial fisheries are located much closer to the hypothetical drilling sites than the .1 score would suggest.

The reader should also take note that these figures may be used to obtain a rough estimate of only a few variables in the entire system of variables which create environmental impacts. While the proximity measure does reflect the presence of some significant shoreline resource, it does not reflect the number, the value, or the vulnerability of these resources. An overview of the most significant resources in each OCS region is provided in Table 119. In addition, Table 120 refers to oil discharges alone, and not to other pollutants.

It cannot be overemphasized that the numbers in Table 120 are extremely crude. Numerous caveats about their interpretation are in order:

- Proximity scores are based on the "severity" column in Table 118 as follows: minimal = .1, moderate-minimal = .3, moderate = .5, high-moderate and moderate-high = .7, high = .9. When an OCS region includes more than one hypothetical drilling site (nearly always the case), the overall regional proximity score is the unweighted average across all sites. No attempt is made to distinguish severity for best and worst seasons. The severity ratings in Table 118, it should be remembered, were based on rather pessimistic assumptions about containment, etc.

- The spill rate figures in columns b and c are taken from Table 111, and the caveats stated in developing that table apply here too.

- Two scales are used for quantifying an appropriate adjustment factor. The "low" scale, used in column d, is built by assigning the Gulf of Mexico a value of 1.0, calibrating the worst areas for natural hazards (Gulf of Alaska and the Chukchi and Beaufort Seas) as 50% more hazardous than the Gulf of Mexico, and interpolating the figures between those two. The "high" scale, in column e, is built in the same fashion and differs only in that it calibrates the high end at 500% more hazardous than the Gulf of Mexico. In both cases, the high and low ends as well as the two intermediate points correspond to the ordered series of four qualitative descriptors used in Table 11/ (low, moderate, moderately high, high). It should be noted that the intervals between adjacent scale points are not equal.

The calibration of these two scales is ultimately arbitrary and highly speculative. The "high adjustment" scale reflects a rather pessimistic view of technological advancement and industry practice in the frontier areas. The "low adjustment" scale is more optimistic, though undoubtedly many scientist and petroleum engineers would probably argue that it is still too pessimistic. In any case, it should be noted that both scales assume no special technical problems from deep water development. Furthermore, no special regulatory or other mitigating features are assumed. That is a subject reserved for Cahpter IV.

- The far left column under "Potential Significant Spillage" records a quantity computed under the table's "best case" assumptions; and the far right column, conversely, reflects the "worst case" assumptions. It should be noted that the two extreme cases can differ, enormously, e.g., by factors of 8 or 10 or even more. These differences are clearly quite sensitive to the assumptions about the amount of oil that might discovered and produced. Although one cannot conclusively demonstrate the point, it seems plausible that of the many different assumptions to which spillage figures are necessarily sensitive this is probably the single most important one.

I. CUMULATIVE IMPACTS

This section deals with those impacts which can not be added together to obtain the aggregate impact either across areas or through time. The impacts of OCS development are usually quite localized and the sum of their separate impacts should produce an accurate statement of the aggregate impacts. Tables 111 and 119 in the preceding sections display these aggregate impacts for all areas. However, when two or more impacts operate together it is possible that their cumulative effect is different from the sum of the individual impacts. When this occurs the area by area or time period by time period impacts discussed in the preceeding sections do not portray an accurate assessment of the aggregate inpacts of the proposal. It is possible for their "cumulative impacts" to be either larger or smaller than the sum of their component parts. Understanding of the complex ways that OCS oil and gas development impacts upon the various components, both living and non-living, of the marine environment is, in general, not sufficient to allow identification of their cumulative impacts. Thus this section will not attempt to define cumulative impacts on any given type of marine life or on any given area. Rather the discussion in this section will be confined to an essentially hypothetical examples of how the effluents of OCS oil and gas development might interact with one another to generate cumulative impacts which are smaller than a larger than the sum of individual impacts.

1. Cumulative Impacts Smaller than the Aggregate of the Component Impacts

Oil spillage [illegible] estimated area by area for both the mean and maximum anticipated production levels. Adding the mean estimates across all 17 areas produces a valid estimate of the expected aggregate oil spillage for the proposal. However, adding the maximum anticipated spillage figures together would substantially overstate the maximum anticipated spillage for the proposal. The statistical reasons why this is true are complex and, perhaps, they are easier to comprehend with an example which is closer to everyday experience than OCS oil spill rates. The maximum anticipated mileage (one chance in 20) for a family car might be 20 miles per gallon for highway drivings on a typical 200 mile trip. The maximum anticipated average mileage for this car on a 4000 mile trip consisting of 20 typical 200 mile trips would be substantially less than 20 miles per gallon. On some of the trips conditions would not allow maximum gas economy and in fact statistically would expect to get 20 miles per gallon on only one trip. The same thing is true with the maximum anticipated (one in 20 chance) undiscovered recoverable oil and gas resource estimates that were used in computing the maximum spillage rates. The sum of the 5% column in Table 110 is 71.1 billion barrels and the Geological Survey estimate of the maximum anticipated (5% or 1 in 20 chance) undiscovered recoverable resource for all 17 OCS areas is only 48 billion barrels.

Another example of potential cumulative impacts smaller than the aggregate of individual impacts is possible for many zones of marine life. Mortalities caused by OCS effluents may not affect the populations of many marine animals at anywhere near the levels indicated by aggregating several separate mortality causing events. For example (purely hypothetical) chronic discharges from platforms in an area may kill 5% of the eggs of a certain species of fish. A major oil spill is the same area might kill an additional 15% of the eggs of this species. Yet the aggregate impact on the year class of that species might be only .01 percent. For species who's females produce thousands or even millions of eggs each year it is entirely possible that additional sources of mortality from OCS operations or extra heavy predation are compensated for by lower than usual mortalities during larval and juvenile stages of the species life cycle. This type of compensation in mortality rates is not limited to eggs and larvae. The ability of marine fishes to support intensive fisheries comes largely from these compensatory reductions in "natu[illegible]."

mortality which are set in motion by the extra source of mortality, i.e., fishing.

One final example will complete this very brief and hypothetical discussion of how cumulative impacts can be smaller than the aggregate of area by area impacts. Oil spills which reach recreational beaches will disrupt if not prevent recreational activities at these beaches until restoration efforts are complete. If three recreational beaches are impacted by oil spills during one year nationwide and further if 40,000,000 visitor days of recreation would have occurred at these beaches what reduction in beach recreation should be expected? The answer is certainly by less than 40,000,000 visitor days because many of the people who would have visited these oil spill impacted beaches will visit beaches which were not impacted by oil spills.

This hypothetical example should not be continued as an argument that oil spills do not cause significant impacts on recreational beaches. They do. However, the total impact of oil spills on beaches measured in terms of total beach recreation could be less than the lost recreation at the impacted beaches. In the next subsection an example will be presented in which the loss of beach recreation in an area exceeds the sum of the individual losses caused by each oil spill.

2. Cumulative Impacts Larger than the Aggregate of the Component Impacts

It is possible for the biological significance of oil spill mortality to vastly exceed the apparent impacts on a species in each of several area or during several time periods. Cumulative impacts in excess of the aggregate of individual impacts can arise do to the interaction between competing species. If one of several interacting species is relatively more adversely affected by the effluents of OCS oil and gas operations it is possible to upset the balance between these interacting species. Even slight differential changes in total mortality of a species in competition with one or more other species can be sufficient to set in motion a series of events which can eventually cause one species to replace another species over wide areas. Apparently similar cycles of species dominance can and do occur as a result of changes in the natural environment. For example, there is substantial evidence that the populations of anchovies and sardines off California have been alternating in dominance for thousands of years. Additionally there have been several changes in the dominant species caught in the ground fish fisheries of the Bering Sea. Whether or not man views the changes in species dominance as favorable or unfavorable depends upon the species involved. For example (purely hypothetical) if OCS oil and gas effluents impacted relatively more severely on dog fish sharks then on salmon (the salmon eggs and young are protected by isolation) and salmon replaced dog fish sharks as the species in the sport catch of Puget Sound we would not consider this favorable change. However, unfavorable species swings are just as likely in this purely hypothetical conjecture. The effluvia of OCS oil and gas operations could impact salmon more heavily than dogfish causing increased relative population of dogfish sharks at the expense of salmon.

The cumulative impacts of OCS effluents on commercial fisheries could be larger than the sum of the impacts on individual species. Consider a hypothetical fishery which is dependent upon catching several different species at different times of the year. Now if OCS impacts caused only a 5% reduction in the catch of say three of these species it is possible that this loss could make the entire fishery uneconomic and thereby generate a economic collapse of the fishery. Further if this fishery served as the principle employment in a community it is possible for the economic collapse of the fishery to generate a similar collapse in the communities dependent upon this multiple species fishery.

As a final example it can be argued that the impacts of several oil spills on an area's recreational beaches could generate total impacts larger than the sum of the impacts of the individual spills. If several oil spill incidents give an area a reputation for having oil polluted beaches it may be years before the recreational use of these beaches returns to our spill levels.

3. Cumulative Impacts and the Interpretation of the Environmental Impacts of the Proposal

While there is generally insufficient information to identify actual cumulative impacts which might result from this proposal the above hypothetical examples point out the potential for real cumulative impacts. The existence of cumulative impacts adds one more problem to a long list of problems already identified for attempts to define with any precision the aggregate impacts of the proposal. A simple sum of the impact in each region may not define the total impacts. Similarly a simple sum of the impacts through the year may not state the true aggregate impacts. These caveats about cumulative impacts should be added to the list of caveats already expressed about interpreting the aggregate impacts of the proposal.

IV. MITIGATING MEASURES

Government has five basic strategies which it will employ to increase the level of effective mitigation: increase financial incentives to lessees to operate safely; set standards and enforce compliance ("regulation"); facilitate research and the rapid diffusion of technical innovation; institutionalize procedures to adjust regulation to suit special circumstances; help coordinate the development plans of private parties in order to minimize expected environmental impacts. These will be discussed in turn.

A. Increasing Financial Incentives to Lessees

Fortunately, the financial interests of operators largely coincide with society's interests in environmental protection, at least with respect to preventing accidental oil spills. Oil discharged during the course of a blowout or platform fire is oil that never reaches markets; and oil that fails to reach a market is oil that earns no income for the company. In addition, there are the high costs of repairing damage to equipment and of delaying operations from which profit is expected while repair work is underway.

Beyond the incentives to protect their own property, the operators have an incentive to protect the property of others, lest they be sued for damages. Union Oil settled claims of $20 million filed by property owners following the Santa Barbara blowout. The company also received considerable adverse publicity.

The claims process which works through traditional legal channels, e.g., State courts, is not altogether efficient, however. It is plausible (though not proven) that many parties forgo valid claims because they are unwilling to commit their time and energy or risk financial costs involved in retaining professional legal counsel. To the extent that oil companies expect to be able to escape paying for damages they have caused, the financial incentives to operate with due regard for safety are thereby reduced. Perhaps the greater deficiency of the current legal liability system, however, is that damages to resources not owned by private parties, e.g., fisheries, are not compensated. Other than the prospects of adverse publicity, no deterrent is at work to protect these environmental resources specifically.

To remedy these deficiencies the Department of the Interior is strongly supporting the draft "Comprehensive Oil Pollution Liability and Compensation Act" initiated by the Council on Environmental Quality. This bill would simplify claims procedures; indemnify claims for damages from oil spills, the source of which could not be ascertained; pay valid claims for damages in excess of amounts for which dischargers were legally liable; circumscribe more narrowly the defenses by which dischargers could escape financial liability; and expand liability for damaged resources not privately owned.

B. Regulation

Through over twenty OCS Operating Orders, the Conservation Division of Geological Survey establishes standards for all phases of OCS operations, from exploration to production, transportation and well abandonment. These Orders, and the relevant sections of the Code of Federal Regulations which authorize them, are contained in Attachment A. Draft OCS Orders have recently been proposed for the Gulf of Alaska. New Orders will be developed for every frontier area individually before leasing, in conjunction with other planning activities relevant to possible leasing in those areas.

These Orders fall, by and large, into one of two categories. They mandate either a particular technology or a particular standard of conduct or practice. Examples of the first category are specifications that well casings be set at certain minimum depths and that velocity-activated subsurface safety valves "...not exceed the calculated capacity of the well to produce against a flowing wellhead pressure of 50 psig." An example of the latter type of requirement is that oil entrained in discharge brines not exceed 50 parts per million on the average.

A mandated practice of special interest is the Provision of emergency oil spill containment and cleanup equipment. USGS must approve operators' oil spill contingency plans prior to the commencement of operations. Large amounts of boom and absorbent materials, power boats, and other oil containment devices are now available both in the Gulf of Mexico (Clean Gulf Associates) and off the Pacific Coast (Clean Seas). They are maintained by specialized cleanup companies supported by consortia of oil companies involved in offshore operations. (Chapter I described Halliburton Services and Clean Gulf Associates in more detail). Similar requirements for emergency cleanup capability will be devised for all frontier areas.

The limiting condition on the potential effectiveness of spill containment technology in the foreseeable future is rough sea conditions. Optimists claim that available technology can handle cleanup in seas with waves as high as six feet. Pessimists argue that four-foot waves are the upper limit. Cleanup technology is ". . .primitive and inconvenient,...." write Kash, White, et al. (1973) but ". . .probably adequate for most spills." (p.129).

Inspectors of USGS Conservation Division conduct both regular and random inspections. During the course of drilling, all operations are inspected at least one time. A complete drilling inspection is normally conducted on each drilling rig approximately every six weeks. Random inspections may be made more frequently.

USGS Conservation Division increased its OCS inspection force from 7 to 43 between 1965 to 1974 and has plans to add another 18 in fiscal 1975. Data on USGS inspection activities, including the imposition of fines, suspensions, and warnings were presented in Chapter 1.

Other Federal regulatory agencies are also involved in OCS operations. The Coast Guard certifies all tankers and barges used to transport oil from the OCS to the U.S. mainland. EPA sets standards for sewage disposal and produced formation water under the Federal Water Pollution Control Act. The Army Corps of Engineers regulates the placing of structures which might pose hazards to navigation. At least six separate Federal agencies (including three separate organizations within the Department of the Interior) have jurisdiction , in one degree or another, over oil and gas pipeline networks. The Department is presently planning to make changes in the standard OCS lease form that will permit State agencies to conduct their own inspections on the Federal portion of the OCS. Although State inspectors would not be able to exercise formal authority over the lessees, they would be able to satisfy themselves that operations were--or were not--being carried on with due regard for safety. If State agents were dissatified with what they found, they would seek to remedy the situation by making recommendations to the USGS Area Supervisor.

USGS maintains ongoing programs to upgrade its effectiveness. At the request of the USGS, safety management studies were made by a team of specialists for National Aeronautics and Space Administration (NASA) and a committee of the National Academy of Engineering (NAE), as well as by a USGS team of analysts, and responses were made to all recommendations, incorporated in 15 categories as follows:

1. Failure Reporting and Corrective Action
2. Accident Investigation and Reporting
3. Information Exchange
4. Research and Development
5. Standards and Specifications
6. Systems Analysis
7. Engineering Documentation
8. Wearout Prevention
9. Training and Certification
10. Motivation Program
11. Lease Management Program
12. Inspection Procedures
13. OCS Order Development
14. Standardization of Forms
15. Safety and Advisory Committees

C. Facilitate Research and Diffusion of Technical Innovation

EPA and Coast Guard are conducting research on more efficient containment and recovery devices (booms and skimmers). The efficiency of booms and skimmers depends on sea state and spill conditions but in any case are never 100% efficient. When the results of these studies, and any other similar studies so indicate, the requirement for use of better techniques and equipment will be incorporated into the OCS regulations and orders as appropriate. If incorporated, the requirements will be applied to all leases.

USGS regularly consults with the American Petroleum Institute with regard to developing better technology. It has also let a number of contracts for systems analysis of OCS operations, and it has successfully encouraged the Offshore Operators Committee in the Gulf of Mexico and the Western Oil and Gas Association to set up safety committees.

D. "Fine Tuning" for Special Circumstances

Leases for oil and gas exploration and development are subject to all OCS operating regulations and orders. Additionally, in some cases the lease may include special stipulations which are considered necessary for the protection of a particular resource or activity in a given area. These stipulations can be designed to meet the needs of a particular resource, e.g., wildlife or waterfowl refuges, fishing areas, certain recreation areas, protection of archeological or historical values, etc., which might be quite sensitive to development of the lease. One common lease stipulation in the area of coral reefs is to require the shunting of muds and cuttings to the ocean floor rather than permit them to be dumped overboard and diffuse through the water column.

It is sometimes desirable to modify the existing set of regulations on very short notice. For this purpose, "Notices to Lessees and Operators" are employed. These notices have the same effects or status as OCS Operating Orders and Regulations and are used when expeditious clarifications or corrections and additions to existing orders and regulations are necessary. One example of a Notice, issued December 11, 1972, explains and details conditions for approval of waste water (oil field brines) disposal from OCS offshore facilities. This Notice provides that such discharges shall meet applicable EPA and/or State standards for effluent limitations, whichever are more stringent, and provides for certain monitoring activities. The ban on offshore use of certain hazardous chemicals was implemented by such a Notice. Minimum geophysical survey requirements to comply with the stipulation to protect archeological and historical resources are also the subject of a Notice to Lessees.

A departure (waiver) from OCS Orders or other rules of the OCS Supervisor may be granted when such a departure is determined to be necessary for (30 CFR, 250.12(b)):

a. the proper control of a well;
b. conservation of natural resources;
c. protection of aquatic life;
d. protection of human health and safety;
e. protection of property; or
f. protection of the environment.

Waivers are technically based decisions and are granted in situations only where expert judgement determines that equally safe operations would result from operations under the waiver.

The Geological Survey is aware of the effects of the near surface geologic environment on drilling, fixed structural emplacements, pipelines etc. Geophysical data, which show the shallow structural and sedimentary environment, are used to predict, and thus minimize, any geologic hazards to drilling operations and consequent possible dangers to the environment from pollution. Surface and shallow subsurface geologic strata, seldom create insurmountable obstacles to a minimal risk program of exploration and exploitation of economically attractive structures.

High resolution geophysical data covering all tracts to be offered for sale is purchased and analyzed by GS geophysical personnel. These data, in the area of coverage, provide definitive information on (1) thickness of the unconsolidated sediments (0-300 feet); (2) structural configuration on shallow seismic horizons (300-500 feet below ocean bottom); (3) sea floor anomalies, mud mounds, mud waves or potential slide areas; pipeline and other objects on the sea floor, and bore hole locations as interpreted from a combined analysis of several geophysical measurements, and (4) bathymetry.

Information from these high resolution data are extremely useful in detecting shallow geologic hazards such as potentially unstable bottom conditions (mud waves, etc.), shallow faults, and in some cases, near surface gas pockets. When these features are identified prior to drilling operations, or platform construction, the operator is notified so he can take the necessary action to assure that his operation is conducted with maximum safety.

Accident analysis is also part of the USGS program. Whenever a significant equipment failure or accident occurs, USGS through its "Safety Alert" system, is able to notify all operators, in order that they may take appropriate actions to prevent recurrences. Reports ofmajor accidents are also kept on file in the regional offices of USGS Conservation Division and are made available to the general public.

E. Helping to Coordinate Private Party Development Plans

Perhaps the most difficult environmental impact for government to control is pipeline siting. The difficulty arises from the profusion of private parties and public agencies all of whom contribute to shaping the ultimate pipeline network.

The Bureau of Land Management has initiated a study to investigate the extent and character of damage to coastal resources from pipeline construction. The study will attempt to develop criteria for pipeline system planning for application in OCS areas which have not been subjected to extensive mineral development. High priority will be given to developing criteria for the protection of bottom and shoreline resources in this study. In addition, an interagency study has been initiated to explore the feasibility of pipeline corridors on the OCS and in coastal marshes. The States of Florida and Alabama have had several working sessions with BLM aimed at delineating potential corridors. Private industry has initiated a study of pipeline effects in marsh areas.

F. The Costs and Benefits of Mitigation

Uncontrolled polluting discharges from OCS operations result either from accidents or from normal operations. In either case, most such discharges are, in an important sense, preventable. Better technology and more painstaking attention to safe practice could eliminate virtually all undesirable discharges. Indeed, the history of OCS development in the Gulf of Mexico demonstrates that continuing improvements along these lines have actually occurred.

If OCS oil were not merely a noxious hydrocarbon substance but were as lethal as plutonium wastes, we could probably invent a safety system that reduced the level of discharges to one millionth of their historical levels. It would be quite costly, however, and might make OCS production prohibitively expensive.

More realistically, the costs of "adequate" mitigation in most areas would be less than prohibitive but would be high enough to cause a significant reduction in the level of bonus bids. That is, if companies know that they will be obliged to spend ten million dollars on mitigation beyond what they would otherwise spend on exploration and development, they will reduce their initial bids by ten million dollars. The Federal treasury will be ten million dollars poorer than it otherwise would have been. Decisions concerning the benefits and costs of imposing additional mitigating measures will often be made on a site-specific basis, usually through the design of certain lease stipulations.

V. UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

The previous section described the generic strategies available to the Federal Government to mitigate the array of potential environmental impacts described in Section III. This section attempts to give a summarized overview of the likely adverse environmental impacts that would result even after mitigation is taken into account.

A. Effects on Marine Organisms

Exposure of biota to crude oil, fuels and solvents, separator fluids, discharged formation waters and drilling muds will produce an adverse effect. The effects of heavy concentrations of crude oil and petroleum derivatives include lethal toxicity, sublethal effects, coating with weathered oil, behavioral and habitat changes. The more subtle effects of light but repeated contamination may be even more serious, but are not well understood at this time. More specific effects are:

1. Marine phytoplankton suffer stress and mortality when exposed to oil in the laboratory.

2. Copepods can ingest and pass oil droplets without apparent harm, but their position in the food chain may allow oil to move up the chain, to more susceptible organisms.

3. Plankton present near the core of a formation water plume will suffer stress and mortality from the higher temperatures, high mineral content, or lack of oxygen in formation waters. This adverse impact will likely not be noticed at the population level.

4. Laboratory experiments show that fish eggs and larvae may be killed by exposure to crude oil, due to clogging of respiratory surfaces. Formation waters may also adversely affect eggs and larvae.

5. Vegetation may be affected by pipeline leaks near- or onshore, as well as by spills from onshore facilities. Small leaks may do little damage, but severe leaks may contaminate the substrate. Several years may be required for recovery.

6. Large numbers of bird deaths have been an obvious feature of past oil spills. This adverse effect is highly probable, once a large oil spill occurs.

Regarding oil spills from various sources (platform fires, blowouts, pipeline accidents, etc.), there have been 44 oil polluting incidents in the Gulf of Mexico from 1964 to April 1974 with a magnitude greater than 50 barrels. The total spillage was 320,000 bbl., over half of which was caused by a pipeline break in 1967 caused by an anchor dragging. New regulations concerning pipeline burial mitigate a recurrence of this type of accident. Since the regulations have been in effect (1970), the spillage rate from all sources has been 0.0017% of the total production of 2.9 billion bbl. of oil and condensate. If the Geological Service's estimates of the mean of undiscovered recoverable resources (Table 106) prove to be correct, this proposal could eventually result in annual production of approximately 3 million barrels per day and annual spillage of approximately 200,000 barrels.

Several oil and gas operations result in temporary increases in turbidity. These operations include the discharge of drilling fluids and the excavation of pipeline trenches by jetting and dredging. Discharged drilling fluids either settle to the bottom beneath the drilling sturcture or disperse as a plume of turbidity several hundred yards in length. The duration of this turbidity is several hours and the area effected is small. Emplacement of pipelines by hydraulic jetting churns up the bottom sediments and causes increased turbidity in a small area along the pipeline route.

The following biological impacts are the unavoidable result of discharging drilling fluids and burial of pipelines.

1. The turbidity plume of discharged drilling fluids reduces the depth to which sunlight penetrated -- thereby, reducing photosynthesis. The area affected is small and no significant impacts on populations of marine organisms should result.

2. The small particles associated with the increased turbidity caused by either discharged drilling fluids or pipeline burial can clog respiratory surfaces and filter-feeding mechanisms of exposed organisms. These physiological stresses can kill benthic animals. If these turbidity caused impacts occur in areas of shellfish beds, reef type communities, or other concentrations of organisms the impacts can become serious. However, by avoiding such areas, the severity of these turbidity caused impacts can be mitigated.

3. Discharged drill cuttings and drilling muds settle to the bottom in a small area around each drilling structure. Immobile organisms are burried by these discharges. If the discharged drill cuttings and muds are of a different texture than the surrounding sediment, the accumulated discharges will likely be slow to recolonize. The areas affected by these impacts even for the entire proposal will be small. If highly productive areas such as shellfish reefs are avoided, the resultant impacts should be small.

4. The dredging and hydraulic jetting operation used to bury pipeline will cause adverse impacts on benthic animals. Softer life forms will likely be killed and others will be made more vulnerable to predation until they successfully cover themselves. Some smothering and burial can also be expected. The area of these impacts will be a small corridor along the pipeline route and there impacts should not be extreme provided highly productive areas are avoided.

5. Drilling muds contain compounds which are possibly toxic to marine life, particularly chromium compounds. It is difficult to determine the magnitude of discharged drilling muds which will result from the proposal. If one thousand, 10,000 foot deep wells are drilled each year, and if five wells are drilled before disposal of drilling muds, then approximately 8000 barrels of mud components (less reclaimed barite) will be discharged at sea each year. This estimate is for all the OCS areas and it provides a means of assessing the likely magnitude of this impact.

Sewage and other solid waste cannot be disposed in untreated condition under current operating orders (this condition is not expected to change in new areas). They must be transported to shore or incinerated (OCS Order No. 7). In general practice, these materials are compacted and incinerated. Some small amount of air pollution is produced, and the ash is disposed of at sea.

B. Wetlands and Beaches

Disturbance of beach and wetlands biota during pipeline burial by the trench and backfill method, uproots all plants and nonmotile animals in the path of the pipeline, leaving a barren strip many feet wide. Some slight damage may also be rendered to vegetation in adjacent areas by machinery used in the operation. The effect is localized, but adverse for the smaller organisms destroyed. No reliable estimates are available for the number of miles of pipeline in the marshes of Texas and Louisiana. If an oil spill reaches a beach, then there will be an adverse effect which may last from weeks to several years or more, depending on the amount of oil, and size and location of the area impacted. Heavily contaminated beaches will be rendered unsuitable for recreation so long as they remain contaminated with oil. If mechanical means are employed in beach clean-up operations (bulldozers, front end loaders and other earth moving equipment) as was done following the Santa Barbara and Arrow oil spill incidents, then shoreline equilibrium may be upset by beach removal. Excessive removal of beach materials can lead to erosional problems unless enough sand and gravel, or other suitable replenishing material is available to replace the removed beach materials.

In the history of OCS leasing, there have only been a few severe incidents related to offshore operations that have affected beaches. Two notable ones are the Chevron fire and the Santa Barbara spill. Most of the 44 oil polluting incidents mentioned previously dissipated at sea, with only some very weathered oil reaching shore in small quantities. However, because of the immense size of the proposal, it is virtually certain that oil spilled during future OCS oil and gas operations will impact the beaches of at least some of the OCS areas. Table 120 section III displays four different estimates of the expected amount of spilled oil impacting beaches each year. These estimates vary dramatically between the various OCS areas and they also vary dramatically with the assumptions used. However, the importance of these results should not be lost in assumptions or in the difficulty of predicting with accuracy the amounts of oil which will impact the natural coastlines as a result of the proposed OCS oil and gas development activities. Even a small amount of oil on heavily used recreational beaches is a serious impacts.

C. Deterioration of Air Quality

Air quality will not be seriously impaired by routine operations; however, degradation could result from several types of accidents. Information from U.S.G.S. indicates there were 38 gas leaks associated with blowouts in the Gulf of Mexico OCS operations between 1956 and 1973. If a natural gas leak or gas well blowout should occur, pollution would be mostly from methane which quickly disperses and drifts away. In areas of sour crude, sulfur compounds may also be released. If a fire results, pollutants would be largely carbon dioxide, water vapor, and oxides of sulfur.

Oil leaks and oil spills not accompanied by a fire, would introduce highly volatile, low molecular weight hydrocarbons, such as benzene and toulene, into the atmosphere. These lighter fractions of crude oil would undergo some unknown degree of degradation, but resultant photochemical smog is one possibility. If the blowout results in a fire, large amounts of particulate carbon, and oxides of carbon, along with unknown amounts of sulfur oxides, nitrogen oxides, evaporated crude oil liquids, and partially oxidized compounds, would enter the air. Local air quality would be severely degraded during the period of the fire. This effect, should a fire occur, would be considered adverse and unavoidable.

The magnitude of gas production invisioned in the Geological Survey's estimated undiscovered recoverable gas resources provides a means of assessing the likely magnitude of the potential impacts on air quality which would result from gas fires. With the best estimates (mean) annual gas production totaling approximately 4.4 trillion cubic feet gas blowouts and fires will occur. Gas production from the OCS was approximately 3.2 trillion cubic feet in 1973. Thus the expected undiscovered recoverable resources could eventually lead to production of about the same level as is currently produced. However, by the time the gas resources of the OCS frontiers are being produced, production from existing fields will be nearly completed so the annual loading of air pollutants from this segment of OCS operations should not change appreciably.

D. Deterioration of Water Quality

Tha adverse impacts on water quality which will result from the OCS oil and gas operations invisioned in the proposal can be summarized under two headings: impacts caused by routine operations, and impacts associated with accidents.

1. Operational Discharges

During exploration and development drilling large quantities of drill cuttings and drilling muds will be discharged into coastal waters. The magnitude of these discharges were presented in section V A. Increased turbidity in small areas is the main effect on water quality. This increased turbidity will persist for the duration of the drilling program. Burial of piplline will also increase turbidity but the duration of this impact will be only a few hours. The likely area impacted by increased turbidity from these two sources is small.

The formation water produced with oil and gas is an important source of adverse impacts on water quality. Formation waters are typically high in mineral content and void of oxygen. Additionally, small quantities of oil (50 ppm) are included in discharged formation waters. With available information it is not possible to quantify the amount of oil which will be discharged with formation waters. However, every one million barrels of formation water discharged would contain 50 barrels of oil. These discharges occur continually from OCS operations and this chronic source of pollution may eventually cause serious adverse impacts.

2. Accidental Discharges

Oil spills can cause serious adverse impacts on water quality. The estimated annual spillages depicted in table 111 demonstrate the magnitude of this problem. If all of the undiscovered recoverable oil resources of all 17 OCS areas were under production at the same time, the mean estimation of the OCS-wide annual spillage is approximately 200,000 barrels. The area by area throughput spillage estimates are depicted in table 111. Oil spillage in amounts as large as those expected is a serious adverse impact on water quality.

E. Interference with Commercial Fishing Operations

As described in earlier sections, trawling operations suffer interference and inconvenience from oil and gas operations in several ways. A small portion of sea floor may be occupied by drilling rigs and platforms and becomes unavailable to trawl fishermen. A normal jack up rig directly removes about three acres of bottom from trawling operations, plus a safety distance. Trawl nets can become snagged on underwater stubs and unburied pipelines, causing damage, to, or loss of, the nets. Less frequently, large objects lost overboard off petroleum industry boats and platforms are caught in trawling nets, resulting in damage to the net and/or its catch of fish. The frequency of occurrence of this type of incident is unknown.

Although commercial fishermen would be expected to move out of the area of an oil spill, spilled oil could coat or contaminate commercial fish species, rendering them unmarketable. This would be another adverse effect to commercial fishing. Fouled gear and boats would reduce fishing effort and hence the catch.

F. Interference with Ship Navigation

Very little intereference can be expected between drilling rigs and platforms and ships that are utilizing established fairways. However, at night, and especially during rough weather, fog, and heavy seas, ships not navigating the fairways could collide with fixed structures. Fishing boats engaged in trawling will be inconvenienced by having to navigate around fixed structures located on fishing grounds.

Increased leasing in areas where oil and gas operations are currently being conducted will not significantly affect ship navigation, as ships are familiar with navigating in these waters and maintain awareness that platform locations must be known from charts and visuals. Some interference with direct line navigation can be expected.

In frontier areas, leasing will lead to drilling rigs and platforms in areas where none presently exist. These platforms will constitute an obvious intereference with ship navigation, and it can be anticipated that this impact will be slightly worse than it is in the Gulf of Mexico until sea captains become used to navigating between the OCS platforms.

G. Damage to Historical and Archeological Sites, Structures and Objects

Should an archeological or historical site on the OCS go undetected by the geophysical surveys required, pipeline burial or the construction of a platform could damage the site. However, the above mentioned surveys are designed specifically to keep the occurrence of this type of damage to a minimum.

Other damage to archeological resources could come from oil contamination. Historical and archeological materials soiled by an accidental oil spill may not survive subsequent cleaning and restoration efforts. Porous materials could be rendered unsuitable for carbon dating techniques. Although the probability of such an incident occurring does exist, the potential for significant historical resource destruction appears small.

The significance of damage to these sites and objects is that damage or destruction precludes meaningful study of the Nation's and the continent's heritage. Most artifacts are quickly destroyed by natural elements; the small amounts of remains are very valuable in some cases the only clues we have to the life styles of previous inhabitants.

H. Interference with Recreation Activities

Interference with recreation is closely related to degradation of aesthetic values. Oil contaminated beaches, freshly cut pipeline routes, terminals, and other onshore support facilities would normally be avoided by those seeking recreation sites for use or development. Disturbance of beaches by pipeline burial operations is very short-lived, relative to recreational use. Oiled beaches may require days, weeks, or years for adequate restoration depending on the initial severity penetration of sand, and location.

Curtailment of recreational activities near coastlines is generally regarded by users as abusive, whatever the cause. Primary users are denied recreation and relaxation deemed necessary by most people for continued mental and emotional health, which in turn allows them to continue productive work. The curtailment also reduces income to recreational suppliers and services in and near affected areas, thus having a direct economic effect.

From a recreation standpoint alone, in terms of usage, different areas are of different importance. Areas such as southern and central California, Galveston and upper Texas, southern (Atlantic and Gulf) and Panhandle and southern Florida, New Jersey, Long Island, and much of the New England coast are all highly valued and highly used areas. Other areas are generally of lesser importance, in terms of recreation.

I. Degradation of Aesthetic Values

It is possible that some portion of platforms, drilling rigs, traffic, and other structures and activities of the oil and gas industry will be visible to a shoreline viewer. If these objects interfere with residential or recreational vistas, the visual effect would be considered adverse by some persons. Night lighting may also be aesthetically unpleasant to some.

Noise from equipment, aircraft, and other traffic associated with gas and oil production and exploration may be objectionable to residents or visitors of an affected area. Within very local areas, increased noise levels may also disturb birds and wildlife during critical life stages (nesting, breeding, etc.).

Odor from oil and gas operations (refineries, treatment plants, etc.) may adversely affect the aesthetic qualities of some areas. Operations involving sour crudes with high sulfur content have a greater potential for producing odor problems.

J. Preclusion of other uses of the Land

The land use requirements associated with OCS development can lead to significant impacts on wetlands and other coastal areas. Pipelines have to come ashore and the pipeline corridors will require displacement of present uses of the shore. Additionally, terminals, construction yards, refineries and other petroleum related activities may be located along the shorelines. As discussed in section III F, State and local governments have considerable control over these impacts. However, if such onshore petroleum facilities are located in wetlands, they will be destroyed. If pipeline terminals, or other onshore facilities are located in agricultural areas, they will remove temporarily small amounts of land from grazing or farming use. Interruption of farming activities until the following growing season usually results. The existence of pipeline terminal facilities would involve the permanent loss of up to several acres for grazing or farming, because each facility usually requires an access highway and is enclosed by a fence. A pipeline leak or tanker spill, however, involving the release of oil into farm land would render the land contaminated and unsuitable for grazing or other agricultural purposes. One or more growing seasons might be required for recovery of affected vegetation and degradation of spilled oil.

A possible conflict exists with the siting of offshore structures and the siting of deep water ports. The U.S. currently has no deep water ports, but several sites are being investigated, including offshore Delaware, and Louisiana, and Galveston and Corpus Christi. In recent months, the seaworthiness and advisability of VLCC's (Very Large Crude Carriers) has come into question, as has the necessity of deep water ports. Off shore unloading at moored buoys may be a more viable technique; this, too, would have potential conflicts with offshore drilling operations, but it is felt that all these potential conflicts can be obviated by adequate planning.

VI. RELATIONSHIP BETWEEN LOCAL SHORT-TERM USE AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The accelerated OCS oil and gas leasing proposal involves massive short term extraction and use of non-renewable resources--oil and gas. It is possible that this short-term use of these non-renewable resources could eventually contribute to declining productivity of the quality of the human environment. Limits to growth is a concept which has been widely discussed and energy resources are often a principle concern in these limits to growth debates. If the nation or world actually does run out of critical non-renewable resources such as energy, adverse long-term consequences would result from the acceleration in the use of OCS oil and gas resources. However, if technological advances allow new energy resources to replace depleted oil and gas resources, these long-term adverse consequences may not occur. This energy limits to growth issue is identified here because it seems to fit within the intended subject of this section. However, assessment of which of the two outcomes of this scenerio is the more likely future state would require a very complicated and conjectual analysis which seems well beyond the proper scope for this analysis.

Another potential source of reduction in long-term productivity might result from the chronic low-level discharges of petroleum hydrocarbons into the coastal waters. Even the short-term effects of chronic discharges are not clearly understood. Yet there is widespread concern that the long-term consequences of chronic discharges could be very serious. St. Amant (1970) observed, "Certainly the significance of the continual addition to, and accumulative effect of, sublethal pollutants in the environment is probably the most important ecological question facing us today." Because the long-term consequences of oil pollution of the oceans is unknown, it isn't possible to define the exact nature of this trade-off between short-term gains and potential long-term adverse impacts. Thus, the potential for adverse long-term consequences from chronic pollution is one of the environmental risks of OCS oil and gas development.

Disturbance of coastal lands by pipeline construction and burial operations and construction of related onshore facilities will decrease productivity in the short-term only. Productivity of coastal lands in the area disturbed by pipeline operations will actually increase following the disturbance, and will fall off to natural levels as original conditions are restored in subsequent growing seasons. However, during the restoration period, uses of the area must be controlled because heavy use such as intensive grazing could serve to keep the disturbed area from recovering at an optimum rate. Additionally, species diversity in the disturbed area will be low during the recovery period and certain wildlife species displaced by construction activities may not repopulate the area for some time.

The cumulative impact of OCS structures as hazards to commercial shipping, and as obstructions to commercial fishing activities, represents a conflict that can be controlled through proper planning and coordination with the appropriate Federal and State agencies and private industry. Some leveling out in the number of platforms is expected as older fields become inactive or hydrocarbon production decreases. This is also true with regard to the cumulative numbers and length (in miles) of pipelines coming ashore. In the case of pipelines, as more and more areas begin to approach termination of production, some additional capacity will be available in existing pipelines to carry production from new areas thereby reducing the numbers of new pipelines required from subsequent lease sales. We are unable to determine at this time if the total number of platforms and pipelines required to develop the OCS areas in the Gulf of Mexico has peaked, but indications are that conditions are approaching a leveling off point.

VII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

A. Mineral Resources

The leasing of OCS lands in 1975 and thereafter could eventually result in the extraction and depletion of tens of billions of barrels of oil and up to approximately trillions of cubic feet of gas. This constitutes an irreversible and irretrievable commitment of our depletable resources. It is an unanswered ethical question whether or not the next few generations of Americans have the right to use these depletable resources rather than transmit them to succeeding generations relatively intact.

Without pretending to answer this question fully, it may be observed that the issue is how fast to consume these resources rather than whether to consume them at all. No one argues that they should never be used - after all, a resource that will literally never be used scarcely ought to be called a "resources". It should also be observed that, until the present, each generation of Americans has been materially better off than the preceding generation. In effect, every generation has invested in long-term capital which has enriched the succeeding generation. Energy has contributed to this capital formation process. One could argue that if the present generation does not consume energy to replenish and enhance the

the capitol stock, succeeding generations will be worse off than our own. They will have plenty of oil but not the wherewithal to make productive use of it.

Perhaps the ethical question is at least in part a practical question as well. Will our own generation use the energy from depletable hydrocarbon resources in such a way as to enrich or impoverish the next generation? If we could be assured that every generation would act only so as to increase the total wealth - not just the mineral wealth - transmitted to the next generation, the ethical question would almost answer itself.

B. Land Resources

The implementation of an accelerated leasing program will eventually necessitate new onshore facilities to handle new production. New production in most geographic regions will be piped to shore. This would entail a traverse of the sea-land interface by each pipe and necessary onshore pumping facilities. Onshore facilities may also include those necessary for separating operations and storage. In nearly all cases, these facilities will be new to frontier area coastlines. The amount of acreage these facilities will occupy in all OCS areas can not be estimated at this time, since these facilities are planned as need arises, i.e., on the production estimated from exploratory drilling results. Acreage per facility is estimated in Section III.I. The use of this unknown amount of acreage in each OCS area will represent a commitment of the land over the time period of production of that region.

The construction of new refineries in onshore areas has been addressed previously. Briefly, it is difficult to estimate what the base case is, i.e. how much refinery construction would take place if there was no acceleration of OCS exploration and production. There would surely be some construction, but the additional refinery construction or expansion of existing refineries that would result from OCS development is difficult to estimate. Increased OCS development in frontier areas with little refining capacity would have some siting impacts, however, in order to be close to production and markets. These locational effects are likewise difficult to assess. Construction of refineries requires a large capital outlay as well as a long time for amortization, and has recently met with strong citizen opposition on the East Coast. It is generally accepted that much of not all new OCS production will accomodate increased demand and then begin to "back out" or replace insecure foreign oil supplies.

C. Biotic Resources

An irreversible and irretrievable commitment of biotic resources and their habitats would occur in areas subjected to intensive development. Oil spills and chronic low-level pollution can injure and kill organisms at virtually all trophic levels. The magnitudes of these effects are nearly impossible to predict, however. Sections III and V identified the types of things that can happen to biota and their habitats. More specific identifications of the kinds of plants and animals, and some information on their population levels and dynamics, will be presented in the site-specific impact statements that will be written for any area proposed for leasing.

VIII. ALTERNATIVES TO THE PROPOSED ACTION

This analysis of alternatives to the proposed action is based on the assumption that accelerated OCS oil and gas leasing could eventually provide approximately 3 million barrels of oil per day and 12 billion cubic feet of natural gas per day. This amounts to approximately 10 quadrillion British Thermal Units (Quads) per year. These assumed production levels are based on the Geological Survey's best estimates of average annual production from the national total of undiscovered recoverable OCS oil and gas resources. See table 106 in Section III.A. It is unlikely that the total undiscovered recoverable oil and gas resources of the OCS will be leased. In fact, it is certain that the proposed accelerated leasing schedule would not lease the total recoverable resources of the OCS. One primary reason why the total recoverable resources will not be leased is the fact that development of some of these resources would entail unacceptable environmental risks. However, because estimates of recoverable resources for each proposed sale are not available, the estimates of total recoverable resources for each area were used in the analysis of the anticipated environmental impacts overstates the actual environmental impacts. Because the estimates of total recoverable resources were used in the analysis of the environmental impacts, it is necessary to use the anticipated production levels from these total recoverable resources in this analysis of alternatives.

Any source which can produce or conserve approximately 10 Quads per year can be considered as an alternative to the proposal. There is a wide variety of alternative energy resources, which, taken alone or in combination with one another, can produce approximately 10 Quads per year. Furthermore, conservation of a Quad is equivalent to production of a Quad. Thus, there is a wide variety of potential alternatives to the proposed acceleration of OCS oil and gas leasing. Analysis of each possibility of this very large group of alternative combinations of conservation and non-OCS energy resources is the essence of developing a comprehensive national energy plan. Developing a comprehensive national energy plan is clearly beyond the scope of this analysis. However, postponing a decision on this proposal to accelerate OCS leasing until such a comprehensive national energy plan is developed, is one of the alternatives analyzed in this section.

In the analysis of the alternative decisions on the issue of accelerating OCS oil and gas leasing, it is assumed that the effective alternative to OCS oil and gas production is imported oil. The logical basis for this assumption is as follows. Presently, approximately 35 percent of our nation's energy requirements are met with imported oil. By 1985, without a concerted effort to conserve energy and to accelerate production of domestic energy resources, our nation could be dependent on imported oil for approximately 60 percent of our energy needs. The Arab oil embargo of 1973-1974 dramaticially raised the question of how much the United States is willing to remain -- or become -- reliant on foreigh oil imports. As a result, the Administration defined a energy independence by 1985 as a National goal. This National goal of energy independence by 1985 requires each domestic energy resource to contribute as much as possible to meet our nation's energy needs. From this viewpoint, the more coal we produce, the less oil we have to import; the more hydropower or nuclear power we produce domestically, the less oil we import; and etc. Domestic energy production is viewed as a logical alternative to imported oil. OCS oil and gas production is no exception to this principle.

A. Defer Action or Take No Action

1. Description

The "defer action" alternative differs from the "take no action" alternative by a minor technicality - to defer action implies a decision on the accelerated leasing issue while take no action is not a decision. The practical result of either of these alternatives would likely be a return to the leasing schedule developed in July 1973 or a modification of that schedule. Under the July 1973 OCS leasing schedule, the frontier areas other than the area off South Texas would not be leased. Rather, leasing was planned for Lower Cook Inlet, Gulf of Mexico, including frontier areas within the Gulf of Mexico as well as a resumption of drilling off Southern California. Under this option it is possible that the July 1973 schedule of OCS sales might be modified. The essence of this option is holding between two to four OCS sales of approximately one million acres each per year. Leasing in the frontier areas outside of the Gulf of Mexico would likely be delayed. However, decreasing the rate of OCS leasing would increase dependence on non-OCS fuels, particularly imported oil. The amount of OCS production under this alternative is difficult to estimate. A lot would depend, of course, on the areas offered for leasing.

2. Environmental Impact

The analysis of the environmental impact of the proposal in Sections III and V present a programmatic sketch of the anticipated environmental impacts of this alternative. To reveal these impacts requires nothing more than selecting from the material presented in Sections III and V the descriptions of anticipated environmental impacts for the areas included in whatever lease schedule is developed. The information presented in Section III and V is sufficient to reveal that this option would have far less OCS environmental impacts than those implied by the accelerated leasing proposal.

If OCS leasing is not accelerated, where will the nation obtain its necessary energy resources? This question can be answered in a very large number of ways for there are many alternative sources of energy. To describe the environmental impacts of each possible combination is well beyond the scope of this analysis. In the following sections key alternative combinations will be discussed. Readers interested in a thorough discussion of the environmental impacts of the major alternative sources of energy are referred to "Energy Alternatives and a Comparative Analyses," Science and Public Policy Program, University of Oklahoma/Kash, White et al. (1975).

B. Reduce the Rate of OCS Leasing Below the Historical Level

1. Description

The proposal calls for accelerating the rate of OCS leasing. One alternative to this action would be to move in the other direction, that is, decelerating the rate. The Department could hold one or two sales a year and lease, say, 500,000 to 1 million acres. If this alternative is selected, the rate of oil and gas production would be substantially lower than the 10 Quads assumed under the proposal. The exact level of production would depend upon the exact rate of leasing as well as the areas selected for leasing. The energy equivalents results of this alternative would be greater reliance on non-OCS energy resources -- primarily imported oil.

2. Environmental Impacts

The environmental consequences of this alternative have two parts: (1) The direct or OCS impacts of the leasing that does occur; and (2) the impacts associated with the alternative energy sources used to replace the foregone OCS energy production. An approximation of the OCS impacts can be taken from the information presented in Sections III and V. Merely examine the impacts for those areas contained in the reduced rate leasing schedule. Some adjustment of scale might also be necessary if sales of small areas are proposed inthe reduced rate schedule. The environmental impacts of non-OCS alternative energy resources are described in Section VIII.F. Logically, in the immediate future, the primary energy alternative is imported oil.

C. Halt OCS Leasing

1. Description

The OCS currently produces about 4.8 Quads of energy for domestic use and some exports. A complete halt to OCS leasing would result in declining production over several years on active leases until reservoirs are no longer economically producible. The measure could be made more drastic by suspending production on active leases and halting leasing. The range of possible consequences for domestic energy production would thus be either immediate stoppage of OCS production or eventual non-production when currently producing fields are dry.

The consequences of such action are profound. The shortfall of production from domestic or secure foreign sources from demand levels would be aggravated. Three methods of handling such a shortfall are apparent, but they are not exclusive, i.e., any number of combinations may be postulated. The methods are: strict conservation efforts, increased imports from insecure foreign sources, and increased stimulation and reliance on alternative sources.

2. Environmental Impacts

The environmental impacts of each of the three methods presented above for replacing current OCS production are described in separate sections of these alternatives. Large scale energy conservation, and its attendant costs, are discussed in Section VIII.E. Increased imports from insecure foreign resources runs counter to the stated National goal, but may in fact be necessary in the longer term if suitable alternatives can not replace the natural depletion of oil and gas resources, or if in fact the estimates of undiscovered recoverable resources are much too high. In the latter case, suitable alternatives may not be able contribute to supplies in the short term, and increased imports may be the only alternative. Crude imports are generally considered more hazardous environmentally compared to OCS development (Kash, White, et al, 1975) because it is done by tanker transportation. Finally, alternative energy sources, their potential for supplying energy in the short and long term and the environmental impacts of their development, are discussed in Section VIII.F.

D. Postpone Decisions About the OCS Until a Comprehensive National Energy Plan is Developed

1. Description

Numerous parties who have commented on the draft impact statement have proposed that a decision to accelerate OCS leasing be postponed pending the development of a national energy plan. What would be the environmental consequences of choosing this alternative, and how might they compare with the consequences of the proposed action? One consequence would be that none of the adverse environmental impacts associated with OCS development would occur for some time. It is hard to think of a truly comprehensive "national energy plan" that would be acceptable to the American public which had not arisen from a fairly widespread consensus, both among elected officials and within the public at large. To arrive at such a consensus would almost certainly take a long time.

If and when we were to reach consensus on a national energy plan, would the plan include the production of OCS oil? If the answer is "no", then the environmental impacts of the presently proposed acceleration would not come about for an extremely long time, if ever. If the answer is "yes," then the environmental impacts would begin to occur very shortly after the plan was implemented.

One can only speculate on the answer to this question, of course. A lot would certainly depend on the set of decisionmakers who would draw up and adopt such a plan. It is plausible, however, that they would look favorably on OCS oil compared to other technologies if they looked at production costs alone. OCS oil would probably cost less than half of what it would cost to produce liquid and gaseous fuels from coal, for example.

Of course, production costs are not the entire set of relevant social costs. There are environmental costs as well. It is not within the scope of the present EIS to examine precisely what all the production and environmental costs of alternative energy technologies would be, much less to propose a way of integrating them into a national energy plan. However, section F of this chapter provides a general overview of thepotential environmental, and some cases economic, costs of alternative energy sources.

2. Environmental Impacts

The environmental impacts of this alternative can be described in three categories: (1) the impacts of continuing OCS leasing at the historical rate; (2) the impacts of the non-OCS energy resources used while the national energy policy is being developed primarily the impact of impacted oil; and (3) the impacts of developing the mix of energy resources selected for development in the national energy policy.

The environmental impacts of continuing OCS leasing at the historical rate were described in Section VIII.A.

The environmental impacts of alternative non-OCS energy resources are described in Section VIII.F.

The environmental impacts of the selected national energy policy can not be described at this time. In the period of time it will take to develop a comprehensive national energy policy technological adverses may occur which might reduce the adverse environmental impacts associated with developing various domestic energy resources. However, these technological advances could likely be applied to existing energy development projects. Thus the impacts described in Section VIII.F. can be used as an approximation of the anticipated environmental impacts of developing these alternative domestic energy resources. As yet undefined technological adjustment in these impacts would likely be necessary, however.

E. Energy Conservation

By "energy conservation" is meant an active program which eliminates altogether the demand for energy which would otherwise have existed. In the present context it means a reduction in demand of roughly ten quadrillion BTU's a year, the BTU-equivalent of an assumed 3 million barrels of oil and 12 billion cf of gas per day eventual production level from accelerated development of the OCS. It also means that not only would OCS oil be held in abeyance, but so would imports.

The primary environmental impacts of conservation are unquestionably beneficial. Albeit in an indirect fashion, they can be stated precisely: none of the environmental impacts associated with OCS development, and described in detail in Chapters III and V above, would occur; nor would we incur the environmental impacts associated with some energy alternative to OCS oil, the main relevant alternative in this case being oil imports.

If the Department were to pursue this alternative, a number of conservation measures might be considered. The Ford Foundation Report has suggested many, as have Project Independence Blueprint (PIB) and the Environmental Protection Agency. There is substantial overlap among the lists, and therefore we may look at just one and get a fair idea of what is on all of them. Table 124 is taken from PIB and estimates the energy savings from various measures under two alternative assumptions about future oil prices. It should be noted that the potential savings from the entire list of conservation measures is 7.40 to 8.53 quads per year in 1985, savings in excess of even the most optimistic projections of energy supply from OCS production in that period. Hence, it is clear that, in principle, PIB conservation measures, if adopted and successfully implemented, could effectively substitute for OCS production through 1985.

There is at present virtually a national consensus supporting the principle of conservation. The hard question is not whether but how much. The question of how much leads immediately and directly to the question of costs, for virtually any level of conservation is plausible provided the nation is willing to bear the costs. What level of conservation entails what cost is subject on which there is, unfortunately, almost no consensus.

Up to a point there is no doubt that conservation can be not only costless but beneficial, economically as well as environmentally. Certain practices are clearly inefficient and wasteful. We may have

Table 124
Conservation Actions and Savings At $7 and $11 Per Barrel Oil
1980 and 1985
(Savings in Quadrillion Btu's)

Conservation Actions	$7 Oil			$11 Oil		
	1977	1980	1985	1977	1960	1985
Transportation						
Establish a mandatory 20 mpg auto efficiency standard	0.38	1.05	2.68	0.26	0.67	1.88
Enact legislation and establish programs that would substantially increase the use of public transit and discourage the inefficient use of automobiles, such as a gasoline conservation fee	1.04	1.12	1.61	0.84	0.89	1.22
Total Transportation Sector 1/	1.42	2.17	4.29	1.10	1.56	3.10
Residential and Commercial 2/						
Subsidy such as a 25% tax credit for retrofit of existing homes, expiring in 1980	0.28	0.45	0.76	0.29	0.47	0.82
Subsidy such as a 15% investment credit for energy reduction investments in existing commercial buildings, expiring in 1980	0.15	0.17	0.20	0.15	0.17	0.21
National thermal efficiency standards for new residential & commercial buildings	0.28	0.54	1.04	0.27	0.51	0.97
Mandatory lighting standards for commercial buildings	0.19	0.25	0.37	0.19	0.24	0.33
Appliance efficiency standards	0.07	0.25	0.65	0.05	0.19	0.47
Total Residential & Commercial Sector	0.97	1.66	3.02	0.95	1.58	2.80
Industrial						
Aggressive conservation programs assisted by R&D for increased efficiency in industrial processes	0.25	0.62	1.22	0.35	0.90	1.50
Total Net Savings 1/	2.64	4.45	8.53	2.40	4.04	7.40
Utilities 3/						
Demonstrations in support of adding energy conservation standards to the Federal Power Act	0.11	0.50	1.01	0.09	0.47	0.91

1/ Savings not entirely additive since auto disincentives would induce some increased new car efficiency.

2/ The gross savings would be higher since losses due to generation and distribution of electricity would be included.

3/ Savings in electrical generation result from decreasing the fossil fuel input required to generate the electricity demand in the three end-user sectors.

Source: Project Independence, FEA, p. 160.

drifted into them through habit or through imprudence, and it might take little more than a new consciousness of such inefficiencies to rid ourselves of them. The Technical Fix conservation strategy of A Time To Choose is based solely on encouraging greater efficiency in energy consumption. It projects an "energy budget" of 91.3 quadrillion BTU's for 1985 which "can provide essentially the same level of energy services (miles of travel, quality of housing and levels of heating and cooling, manufacturing output, etc.) as the Historical Growth scenario, if the nation adopts specific energy saving technologies, such as better insulation and better auto fuel economy, to perform these functions."

All measures proposed for this strategy, according to the Ford report, would also meet the criterion of saving consumers money. A sample list of such measures includes:

- -- Installing better insulation in new homes
- -- Add "heat recuperators" to industrial furnaces
- -- Increase the fuel economy of automobiles from 12 to 20 miles per gallon without reducing automobile size through engineering, design, and materials changes
- -- Install heat pumps for home space heating and cooling

-- Alter the rate structure of electric utilities to incorporate peak load pricing and to abolish volume discounts

-- Specify certain thermal performance standards in local building codes.

The more ambitious ZEG (Zero Energy Growth) strategy goes beyond efficiency and redirects economic growth away from "making things" and towards "services designed to enhance the quality of life," like better bus systems, and more parks, and better health care (p. 15). It includes all the energy-saving devides of the Technical Fix strategy, an array of excise taxes on energy, government investment in new energy technologies, and changed government regulatory practices. The authors of the Ford report rely on a rather sophisticated computer simulation of the national economy in concluding that achieving ZEG in 1985 and continuing it thereafter would permit general economic growth "at much the same pace" as the scenarios of higher energy growth (Technical Fix and Historical Growth). They argue, further, that the transition to ZEG, if accomplished "over a period of decades," would probably be less severe than many transitions the economy and the society have undergone in the past, e.g., the migration of 13 million persons from the farms to the cities during the period 1950-1970. (p. 93)

How costly might these conservation strategies actually be? The efficiency-inducing measures prescribed by the Technical Fix strategy would--if the cost analyses done by the authors of the Ford Report are correct--bring net benefits, not costs, to the society as a whole. In some instances, to be sure, there would be serious adjustment problems for certain firms, industries, or economic sectors as more energy-efficient and economical substitutes for their products or services displaced them. These changes cannot be counted legitimately as social "costs," however, since they merely terminate a subsidy paid by the many-through higher prices--to the few.

Of much more concern are the costs entailed by the ZEG scenartio. Perhaps the economic consultants who confidently predict a bright future of low energy consumption accompanied by high economic growth are correct. Since the model in the Ford report is almost the first of its kind, and has not yet been subjected to rigorous criticism from other model-builders, it is probably premature to accept the optimistic conclusions drawn from it unreservedly.

On the other hand, the conclusion that GNP will not fall by very much under ZEG does seem reasonable. Direct energy consumption [illegible] all sectors represents only a tiny proportion of the GNP-around 4%. The ZEG policy scenario of slowly rising energy prices in the post-1985 period allows plenty of leeway for the economy to adjust: both labor and capital can, under different conditions, become substitutes for energy inputs in all economic sectors.

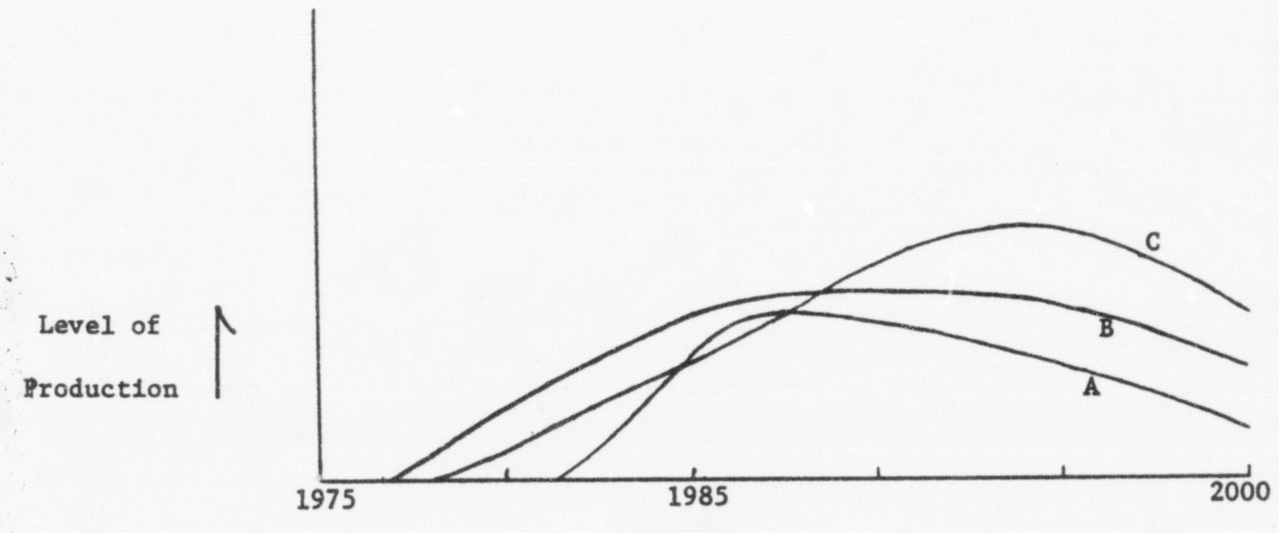
A more serious problem with the ZEG projection is that GNP is a very crude measure of the true value of goods and services to the society. It should be remembered that the driving feature of the ZEG scenario is a government tax on energy, the result of which is to allocate less of society's resources to energy development and consumption and more to whatever it is government chooses to spend the revenues on. In the ZEG scenario energy excise tax revenues rise from a few billion dollars in 1985 to $50 billion (in 1971 dollars) in 2000. The Ford model allocates these expenditures to health, education, and transport services (75% spent on purchase of labor and services, 20% on manufactures, and 5% on purchases from the transport sector). (p. 509)

F. Environmental Impacts Associated with Alternative Fuel Sources

For the sake of discussion we shall assume that accelerated OCS production would eventually be 3 million barrels of oil and 12 billion cubic feet of gas per day. This assumption is based on both PIB estimates of OCS producibility in 1985 and USGS estimates of OCS producibility to 1985 and beyond. The two data sources generally support one another, and differences are only artifacts of the time periods selected for estimation of producibility. It should be emphasized, however, that any such projections are highly speculative. Not only do we know very little about the true quantity of oil and gas resources on the OCS, we also do not know how rapidly they can be discovered and brought into production. Figure 129 shows three hypothetical time profiles for OCS production, and many other variations are also possible.

Figure 129

Hypothetical Time Profiles for OCS Production



Increased Oil Imports

At present, the United States imports about 6 million barrels of oil per day, or about 35% of domestic consumption. The Arab oil embargo of 1973-1974 dramatically raised the question of how much the United States is willing to remain--or become--reliant on foreign oil imports. Depending in part on answers to this question given today, the United States could find itself in ten years importing anywhere between 0 and 60% of its oil needs.

One of the considerations in answering this question is the degree of environmental risk in OCS production relative to the comparable risks of oil imports. It appears that of the two sources the OCS is somewhat less environmentally hazardous. Energy Under the Oceans, a "technology assessment" of OCS operations conducted by a team based at the University of Oklahoma, rated the OCS as more favorable than imports on a worldwide basis:

> "Considering worldwide environmental impacts, the OCS is less of a threat to the environment than increased imports would be. In part, this is due to the harmful effects of refined products which have to be considered with imports. If only U.S. waters are considered, imports appear to have an advantage, but this fails to take into account differences in kind of petroleum spilled and the fact that spills outside can produce effects within U.S. waters." (Kash and White, pp. 242-3.)

Based on historical data, the interpretation of which was greatly hedged by qualifications, an MIT report ("Analysis of Oil Spill Statistics") estimated spill rates at .017% for total throughout from OCS production and .016% for tanker imports. But if one considers OCS-related oil discharges only since 1970, when new pipeline regulations went into effect, the spill rate is .009% rather than .017%.

Coal

The primary environmental impacts of coal begin with coal mining. Underground mining may cause land subsidence and poses hazards to the health and safety of miners. Strip mining and open pit mining disrupt large surface areas, causing destruction of topsoil, wildlife habitats, and vegetation. Revegetation is more difficult in dry areas, including those where much of the Western coal reserves are found. Large volumes of mine wastes require disposal. Water quality problems may arise from damage to the ground water regime, acid mine drainage, and increased run off and sediment loads in streams. Stripping increases the dust in the air. Combustion of coal, especially high sulfur coal, releases particulates and gaseous pollutants. Technology to control these pollutants is not completely developed. Desulfurization of high sulfur coal before use and sulfur removal during combustion remove only limited amounts of sulfur. Much effort is now being directed toward development of processes to remove sulfur from flue gases or other process gases before discharging them to the atmosphere.

A recent report by Hittman Associates (under contract to CEQ, EPA, and NSF) attempts to quantify the impacts of the several different processes associated with the use of coal. For the purpose of comparison with OCS oil, it is useful to focus on two such processes, extraction and combustion in steam electric generating plants, an end use common to both fuels. The Hittman data on extraction processes are shown in Table 130. They refer to impacts (variously measured) per trillion (10^{12}) BTU. It should be noted that the table does not include water pollution which would be caused by chronic or accidental oil spills offshore.

The data on coal extraction assume "the use of control technology which will probably be required and/or available in 5 to 10 years." For instance, contour backfilling and revegetation are assumed, and a corresponding reliance on such practices as stockpiling and redistribution of the topsoil, segregation of toxic overburden, and seed bed preparation. For the Central Appalachian region, the 442 tons of solids represents a transformation of water pollutants, including acids, into solid refuse.

An entry which deserves special comment is the amount of land disturbed in coal mining. Revegetating backfilled strip mines takes several years. The Hittman study assumes five years to reclaim any given acre in the Powder River Basin, for instance. This assumption may be optimistic, since in many arid and or semi-arid areas of the West certain lands will be difficult or impossible to revegetate.

Table 130

Environmental Impacts of OCS Oil, Onshore Oil and Coal
(Impact per Trillion BTU's)

	OCS Oil	Onshore Oil	Powder River Basin Coal	San Juan Basin Coal	Central Appalachian Coal
Water Pollutants 1/					
Dissolved Solids	-	-	0	0	29.2
Suspended Solids	-	-	0	0	.423
Non-degradable Organics	0	.52	-	-	-
Air Pollutants 1/					
General 2/	0	0	4.23	9.10	0
Solids	-	-	775	546	442
Occupational Health and Safety					
Deaths	.00002	.00027	.0025	0.0	.0218
Injuries	.00027	.0125	.0165	.0729	.955
Man-days lost	.144	2.07	1.5	.838	3.42
Land 3/	.173 4/	40.5	4.14	13.4	181.0

Source: Hittman Associates, Inc. 1974. Environmental impacts, efficiency, and cost of energy supply and end use. Final report HIT-293 Contract CQC 308 with CEQ, NSF, and EPA. November 1974.

1/ Impact measured in tons.
2/ Includes SOx, NOx, particulates, hydrocarbons, CO, Aldehydes.
3/ Impact measured in acre-years.
4/ Refers to onshore terminals.

Table 131 displays the differential impacts of coal, oil and gas as fossil fuels burned to generate electricity. Coal-fired plants use somewhat more land than oil-fired plants and produce slightly more air pollution, even under controlled conditions. Without controls, coal produces almost six times more air pollutants than oil.

The data in Tables 130 and 131 are expressed in terms of impacts per trillion BTU. They can be scaled up to the equivalent of 10 quads by multiplying the entried by 10,000, although one should not that the aggregate of these impacts is almost surely less important than the localized impacts where they occur.

If all the coal which was to substitute for OCS oil were mined from the Powder River and San Juan Basins, and divided equally between the two (i.e., two quads from each area), the annual rate of land disturbance (assuming continuous and successful reclamation) would be 32.3 square miles in the former and 105 square miles in the latter. Assuming all this coal were to come from new mines, producing at the rate of ten million tons annually, we would have to open approximately 27 new mines in the Powder River Basin and 25 new mines in the San Juan basin. Alternatively, development in either of these western regions could be foregone in favor of obtaining equivalent annual production (five quads annually) from 62 new underground mines in Central Appalachia each producing 3 million tons per year.

Table 131

Environmental Impacts of Coal, Oil and Gas Power Generation
(Impact per trillion BTU's)

	Oil	Coal	Gas
Land 1/	4.5	16	2.8
Air Pollutants 2/			
With Controls	715	787	222
Without Controls	1200	6970	222

Source: Hittman Associates, See Table 130.

1/ Impacts measured in acre-years.
2/ Impacts measured in tons.

One of the principal problems with coal as an energy source competing with OCS oil and gas is that there is relatively little demand for it outside the electric power industry. Two thirds of the nation's coal production is utilized in power generation. Metallurgical coking coal enjoys a small but steady market of about 95 million tons annually. Coal used in the industrial sector has declined from 104 million tons in 1965 to 68 million tons in 1973. (PIB, p. 100) Although coal might be widely used in future electric power plants, it would substitute not primarily for oil (whether from the OCS or any other source) but for nuclear power. PIB (p. 127) projects almost no new oil-fired generating capacity between now and 1985. A conversion of present oil-fired plants to coal would be relatively small-scale: a recent Bureau of Mines estimate indicates that 23,697 MW capacity could be converted from oil to coal, given a year's lead time, the annual savings from which (in oil) would be 198.4 million barrels. Substituting coal for oil in power plants, therefore, could not account for more than about 20% of expected OCS oil production.

In the long run if the United States is to make use of its vast coal resources (some 3.2 trillion tons), converting solid coal to more useable gaseous and liquid forms will be necessary. At present, gasification and liquefaction processes are barely out of the pilot plant stage of development and are relatively costly, though competitive with crude oil at an assumed $11/barrel price for the latter (PIB, "Synthetic Fuels From Coal," p. 11).

A typical coal gasification plant would produce 250 billion BTU's of pipeline gas per day, consume six to ten million tons of coal annually, use copious amounts of water (6,000 gallons of water per minute), and have capital costs of $175-300 million. Each plant would require about 200 acres of land. Air pollution residuals would include sulfur and nitrogen oxides and ash particles. Solid waste disposal could cause surface water contamination problems. Solid wastes are generated in great volume and might represent a disposal problem as well. Both air and water pollution residuals can be reduced by existing and emerging technology, although there are still some uncertainties about appropriate emission standards and the economics of various control technologies. Substitution for one half of projected OCS production, or five quads, would require 55 coal gasification plants of 250 billion BTU/day capacity each.

Nuclear Energy

In the foreseeable future nuclear energy will be available almost exclusively in the form of electricity. More rapid introduction of nuclear energy in the electric generating sector, therefore, will displace not oil, primarily, but coal. Hence it is questionable to what extent nuclear energy can be considered as a plausible "alternative" to OCS (or even foreign) oil. Much depends on how rapidly growth in the electrical sector might displace oil in the residential, commercial and industrial sectors. PIB projects a 6.3% annual growth rate in electrical generating capacity at $11/barrel oil. If public policies are adopted to encourage growth in the electricity sector (presumably in order to increase utilization of our domestic coal resources and our advanced nuclear technology), growth in this sector would be 7.4%.

The PIB task force on nuclear energy report indicates that one thousand megawatts of nuclear capacity equals 25,000 barrels of oil per day (p. 2.0-2). Hence, to substitute completely for OCS oil expected from accelerated leasing, the nation would need approximately 200 such plans.

Although nuclear plants do not emit particulates or gaseous pollutants from combustion, several unique environmental problems arise. Some radioactivity in the form of radiation, airborne radioactivity, and radioactive liquids, is released to the environment. Although the amount released is very small and potential exposure has been shown to be less than the average level of natural radiation exposure, special precautions are required to control these emissions. The possible release of radioactivity as a result of an accident must be anticipated in the design of the plant and its emergency systems. Malfunction of the emergency core cooling system has been of particular concern.

Nuclear plants use essentially the same cooling process as fossil fuel plants and thus share the problem of heat dissipation from cooling water. However, light water reactors require larger amounts of cooling water and discharge greater amounts of waste heat to the water than comparably sized fossil fuel plants. The effects of thermal discharges may be beneficial in some cases. Adverse effects can be mitigated by use of cooling ponds or cooling towers.

Low level radioactive wastes from normal operation of a nuclear plant must be collected, placed in protective containers, and shipped to an AEC storage site and buried. High level wastes created within the fuel elements remain there until the fuel is spent. They are then isolated in a fuel reprocessing plant and stored in liquid or solid form at AEC facilities. There is much concern over the ability of this, or any other, society to store and manager these wastes for thousands of years. Probably the technical aspects of this problem are more readily solved than the political and social aspects of the problem. The problem also raises interesting considerations of equity: Is it fair to hundreds of future generations to saddle them with the nuclear wastes we create today?

Another problem with nuclear power is the prospect of "intentional disruption of nuclear power systems for malicious purposes," in the words of the Ford Foundation energy report (p. 211). The difficulties here range from the diversion of nuclear materials to weapons purposes by nation-states to terrorism and sabotage directed at nuclear generating stations and transportation facilities.

Oil Shale

Oil shale occurs in large volumes throughout the U.S. and potentially could contribute significantly to U.S. energy supplies. The richest deposits are found in the Green River Formation in Colorado, Utah, and Wyoming. An estimated 80 percent of these resources are on Federal lands. These oil lands are sparsely settled and arid or semi-arid.

As shale oil is relatively expensive to produce, the main obstacles to development of oil shale in the U.S. have been abundant oil, gas, and coal at lower costs. As availability of these energy sources declines and prices rise, the economics of oil shale become more favorable.

From 1944 to 1956 the U.S. Department of the Interior conducted extensive research on mining and retorting oil shale and refining shale oil. For the past 10 years, private industry has operated prototype plants and experimental facilities. There has been no commercial production of oil from oil shale as yet.

The Department of the Interior has initiated a prototype oil shale leasing program to make available rich oil shale lands for development by private industry.

The major options for oil shale development are (1) mining (underground or surface) followed by surface processing of the oil shale, or (2) in-situ (in place) processing. In-situ technology is important for eventual recovery of deeply buried oil shale but is less advanced than conventional processing. Projections of future oil shale capacity are given below.

Table 132. Production Projections of Shale Oil (thou. B/D)

	1975	1980	1985
Case I	0	150	750
Case II/III	0	100	400
Case IV	0	0	100

(Source: National Petroleum Council, p. 205, 1972)

Case I represents the maximum feasible production under non-emergency conditions and assumes shale oil prices adequate to encourage commercial development. Limitations on rate of development include availability of operating personnel, environmental restrictions, lack of supporting commerce and industry, and construction logistics. Cases II, III, and IV show slower rates of investment due to lack of incentive or need for time to demonstrate process feasibility.

The Department of the Interior has estimated maximum 1985 production of shale oil at one million barrels daily (U.S. Department of the Interior, vol. I, p. III-6, 1973a).

Project Independence Blueprint projects production of 250,000 barrels per day by 1985 if the world oil price drops to $7/barrel. Production levels of 1,000,000 barrels per day could be attained if the world oil price were to stabilize at $11/barrel (pp. 130-132). Thus even under the most optimistic assumptions, shale oil could not wholly displace OCS production.

Environmental problems related to the extraction of shale oil by conventional (as opposed to in-situ) retorting are magnified by the large volume of rock that would be processed in a commercial operation. A plant producing 100,000 b/d would probably mine about 130,000 tons of oil shale per day and would require disposal of a similar amount of spent shale. Surface disposal of the spent shale creates the problem of revegetation. Other problems are prevention of contamination of streams by saline water encountered in mining or by leaching of salts from spent shale.

The Green River Formation area is sparsely settled and arid or semi-arid. Development of an oil shale industry would change existing land use patterns and create a major socio-economic impact in a region now without large scale industry. It would also disturb regional wildlife. The Colorado oil shale lands have some of the largest migratory deer and elk herds in the world.

Roads, mining plant sites, waste disposal areas and utility and pipeline corridors would disturb the vegetative cover of the land. The requirement of large amounts of waste water and the disposal of waste water with dissolved saline and organic compounds without degrading natural ground waters would place added stress on the scarce water resources of the region. Increased noise and a decline in air quality due to dust from mining and shale disposal and particulate and sulfur and nitrogen oxide emissions would accompany oil shale development.

For a fuller description of the environmental impacts of oil shale, see the environmental impact statement on a prototype production project prepared by the Department of the Interior.

Increased Domestic Onshore Oil Production

In 1974 domestic production from existing oil fields in the lower 48 States was 8.9 million barrels per day. Most of the major onshore fields have probably been discovered and are being produced now. Hence, PIB projects a decline in production from present conventional and new primary fields to 4.9 million barrels per day in 1985.

This loss of 4 million barrels per day could perhaps be made up by secondary and tertiary recovery methods. The advent of dramatically higher prices for oil on the open market has stimulated development and investment in enhanced recovery techniques that allow greater production from a given field. Secondary techniques are generally injection techniques; water or gas is injected into a reservoir in order to drive the oil toward the well. Tertiary techniques are more exotic, and include explosive fracturing of reservoirs to allow easier movement of oil.

The Project Independence Oil Task Force Report estimated that by 1988, under business as equal (BAU) assumptions, and assuming on $11/bbl. price, secondary production onshore could be adding as 2,800,000 bbl/day to our domestic supply. Tertiary production onshore could be adding 2,650,000 bbl/day. Under the accelerated development assumptions, an additional 840,000 bbl/day could be produced over and above these figures for BAU by tertiary techniques.

Another way of making up the expected loss from conventional primary fields onshore would be to open the Naval Petroleum Reserves. The Elk Hills Reserve (#1) could produce .2 million barrels per day by 1985 under PIB accelerated development (AD) assumptions and an $11/barrel price. The Alaskan Reserve (#4) could be producing fully 2 million barrels per day under the same assumptions.

Alaska North Slope oil will be flowing at 2.5 million barrels per day in 1985 under either BAU or AD assumptions.

There are several possible environmental impact of the Naval Petroleum Research oil and gas development. A major one is air or water pollution. Surface discharge of oil or gas can cause damage or destruction to wildlife, contamination of soil, and at least temporary damage to vegetation, especially in aquatic or semi-aquatic habitats. Subsurface water resources might also be endangered, with the possibility of contamination of aquifiers by leaks of petroleum, natural gas liquids, or brine. Secondly, operations might adversely affect the aesthetic enjoyment of the area by those who use it for recreational purposes. Physical senses of sight and sound are difficult to communicate, but are nevertheless important to the individual. Thirdly, there would be some loss of vegetation and damage to the wildlife habitat due to development activities such as land clearing, road building, noise, dust, odor emission, as well as physical danger to animals due to increased vehicular traffic. If hydrocarbons are discovered, long term surface occupancy would displace wildlife. There is also a risk of fire that must be considered.

It is believed that proper measures can minimize the adverse effects, especially if only exploratory drilling is carried out. Major short term effects are likely to be relocation of wildlife and disturbance of vegetation. Longer term production operations entail corresponding dislocations. The other major problem for both short and long term operations is the discharge of oil or salt water due to accident or equipment malfunctions. A large spill could affect recreation, local residents, and commercial fishing, but the time period would be of limited duration.

See also the immediately preceding tables 130 and 131.

Increased Hydroelectric Power

Thirty to forty years ago, hydroelectric power supplied as much as 30 percent of the electric energy produced in the U.S. Hydroelectric power has increased steadily but at a rate slower than the growth rate of thermal plants. Today, conventional hydroelectric plants supply about 15 percent of U.S. electric generating capacity and electric energy production.

Most of the suitable hydroelectric sites have already been developed. New hydropower generating capacity added by 1985 could increase total hydropower capacity from 66,000 MW to 100,000 MW, if world oil prices remained at $11, according to PIB. Because hydropower is used more and more to supply peak load electricity rather than base load demand, this increase in capacity might result in as little as 20% increase in actual hydroelectricity. Many hydro sites are potentially available in Alaska. But these are too far from major markets to add much to national energy supply.

Although hydropower plants produce virtually no air or water pollution, they do impose environmental costs.

Construction of a hydroelectric dam represents an irretrievable commitment of the land resources beneath the dam and the lake. Inundation of the land eliminates wildlife habitat and precludes other uses such as agriculture, mining, and free-flowing river recreation. Some increase in erosion during construction and operation will occur.

Hydroelectric projects use a renewable resource, do not directly cause air pollution, and offer some recreational activities. On the other hand, use of streams for power will displace some forms of recreational activities and eliminate vast areas for land uses. Water released from reservoirs during summer months may change the water temperature and lower the oxygen content of the river downstream, adversely affecting the indigenous fishery. Fluctuating flow releases for peak load operation may also adversely affect reservoir and downstream fisheries and recreation. The lack of satisfactory means of passing anadromous fish over high dams presently precludes development of some hydroelectric sites.

Fish may die if exposed to nitrogen supersaturated water. Nitrogen supersaturation results at a dam when excess river flow must be passed over the spillway. High nitrogen levels in the Columbia and Snake Rivers pose a threat to salmon and steelhead resources of these rivers.

Increased Pipeline Imports of Natural Gas

Imports of natural gas via pipeline have come largely from Canada, with small amounts from Mexico. In 1973 net pipeline imports from Canada were 1,012 Bcf, about 4.2 percent of total natural gas used in the U.S. These imports were about 45 percent of Canada's natural gas production. Natural gas pipeline imports from Mexico have not been a significant part of U.S. supply. In 1973, imports from Mexico were 1.6 Bcf. Almost 95 percent of pipeline gas imported in 1973 was delivered to interstate companies for transmission to major markets.

Table 133

Projections of Natural Gas Pipeline Imports for Canada

	Actual 1973	1975	1980	1985	1990
Case I	1.0	1.0	1.0	0.9	0.2
Case II	1.0	1.2	1.4	1.4	2.1
Case III	1.0	1.2	2.2	2.2	2.6
Case IV	1.0	1.2	2.9	2.9	3.7

Units - trillion cubic feet
(Source: Federal Power Commission, p. 45, 1974a).

Case I represents the minimal case and shows volumes scheduled for export from Canada to the U.S. under current National Energy Board (NEB) and FPC authorizations. The case assumes no additional export authorizations granted through 1990.

Case II is a "conservative realistic" projection. It includes additional supplies under the following assumptions: (a) the NEB will authorize some additional exports from the traditional gas supply areas, (b) a large-diameter gas pipeline from the North Slope of Alaska through the Mackenzie Delta area will be completed and operating at capacity by 1989. About half of the line's throughput will be from Alaska, (c) a large-diameter gas pipeline from the Arctic Islands will be completed and operating at capacity by 1990, and (d) by 1985 approximately 0.5 Tcf per year of the new supplies from the frontier areas will go to Canadian markets.

Case III is an "optimistic realistic" projection which has the additional element of a pipeline from the Atlantic Offshore. The assumptions are: (a) the NEB will authorize some additional exports on a short-term basis from the traditional gas supply areas until gas is available from the frontier areas, (b) the Alaska North Slope-Mackenzie Delta pipeline will be completed and operating at capacity by 1979, with subsequent increases in capacity in both 1985 and 1990, (c) the Arctic Islands line will be completed by 1984, and the maximum throughput will be increased by 1990, (d) a pipeline from the Canadian Eastern Offshore area to market areas in New England will be completed by 1980, and (e) by 1985 approximately 1 Tcf of gas per year from the frontier areas will go to Canadian markets.

Case IV is the most optimistic situation and is basically the same as Case III with the following exceptions: (a) the Alaska North Slope-Mackenzie Delta pipeline will be completed by 1978, (b) the Arctic Islands pipeline will be completed by 1979 with subsequent increases in capacity by both 1985 and 1990, and (c) substantial increases in capacity will be installed on the pipeline from the eastern offshore by 1985 and 1990.

In 1973, pipeline imports from Canada were delivered as follows:

West Coast Area (California, Oregon, Washington)	69 percent (a little over half of this used in California)
Great Lakes market	26 percent

Montana	5 percent
New York and Vermont	less than 1 percent

Further imports from Alberta, if additional imports are authorized, will likely follow the established distribution pattern. Gas from Alaska's North Slope and Canada's Mackenzie Delta will likely come into the lower 40 States. Gas from the Canadian Atlantic Offshore area will be delivered to New England. A gas pipeline from the Arctic Islands, depending on the route, could deliver gas directly to the northeastern States, or make gas available for the West Coast and Great Lakes areas by displacement.

The proportion of imports coming into different regions could change considerably from present patterns. This will depend on the completion schedule of various proposed pipeline projects and regional demand for the Canadian gas.

Mexico is not likely to be a significant source of future imports because of its relatively small natural gas resources base, its policy of self-sufficienty in energy, and the small volume of current U.S. imports from Mexico. Imports from Mexico were of a local natural until 1957 and have decline since 1969. In 1973, they were only 1.6 Bcf, while exports to Mexico from the U.S. were 13 Bcf.

The environmental impacts of increasing gas imports derive mainly from the possible increased use of land for pipeline construction. Reliable estimates are not at hand relating carrying capacity of existing or planned pipelines to their actual load. To whatever degree that land is utilized for new pipelines to handle increased pipelines, this will determine the primary impact of this alternative. A less important impact is the risk of explosions and/or fires. The increased pipeline mileage or increased use of existing lines increases this risk, as does the increased use of tankers carrying LNG (liquefied natural gas).

For a more detailed statement of the environmental impacts of increased pipeline imports, see the Department of the Interior draft environmental impact statement on the Arctic gas pipeline.

Increased Liquefied Natural Gas (LNG) Imports

Liquefaction and transportation of foreign natural gas to the U.S. could contribute significantly to U.S. gas supply. Liquefied natural gas imports are of two types: short-term or long-term. Short-term imports are contracted for on a spot basis for delivery over a short period, at most a few years. Short-term imports in 1973 totalled less than 1 Bcf, and were from Algeria and Canada. Long-term imports are contracted for on a regular basis over a relatively long period, usually 20 to 25 years. Long-term imports from Algeria were about 3.1 Bcf in 1973 and were used for peak shaving supplies. There have been no long-term imports for base-load use in the U.S.

Long-term LNG projects are very capital intensive and require commitment of sufficient reserves for a project life of about 20 to 25 years.

There are four phases in such projects: (1) field development of foreign gas reserves, and pipeline facilities, (2) liquefaction plant and shipping terminal, (3) marine transportation, and (4) receiving terminal, regasification plant, and pipeline facilities. Highly specialized ships capable of maintaining LNG at cryogenic temperatures are required.

Projections of LNG imports are shown below.

Table 134

Projected Foreign LNG Imports
To the Contiguous United States
1975, 1980, 1985, 1990
(Trillion Cubic Feet)

	1975	1980	1985	1990
CASE I	*	.4	4	.4
CASE II	.1	1.5	1.5	1.5
CASE III	.4	2.7	3.8	3.8
CASE IV	.4	3.2	3.8	4.7

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* 15 billion cubic feet.

(Source: Federal Power Commission, Vol. i., Chapter 10, p.69, 1974a)

Case I assumes that only those projects which are presently approved by the FPC will be completed.

Case II assumes only projects approved by or filed with the FPC will be completed.

Case III assumes projects approved by or filed with the FPC or noted in the trade press will be completed.

Case IV assumes all projects under Case III and others for which little data is available will be completed.

Future LNG imports will depend on Government policies, U.S. ability to compete on the world market for natural gas supplies, availability of capital, availability of LNG shipbuilding capacity, and amount of surplus world-wide gas reserves. It is not likely that foreign gas reserves or world-wide shipbuilding capacity will limit U.S. LNG imports. (Federal Power Commission, p. 71-80, 1974a). However, development of baseload LNG projects in the U.S. will depend largely on Government policies and support (possibly loans and guarantees) and multinational planning and financing.

Most LNG delivery points for planned projects are on the East coast (Georgia, Maryland, Massachusetts, New Jersey, New York). A few projects plan West coast delivery (notably to California) and one a Texas delivery point.

Potential sources of LNG are Algeria, Australia, Abu Dhabi, Brunei, Ecuador, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Malaysia, New Zealand, Nigeria, Pakistan, Papua, Qatar, Saudi Arabia, Trinidad and Tobago, U.S.S.R., and Venezuela.

The environmental impacts of LNG imports are related to tankers; terminals, transfer and regasification facilities; and transportation of the gas. The primary hazard of handling LNG is the possibility of a fire or explosion during transportation, transfer, or storage.

Receiving and regasification facilities will require primary shoreline locations and dredging of channels. Regasification of LNG will release few pollutants to the air or water.

Solar Energy

Solar energy utilizes a renewable resource and lacks many of the adverse environmental impacts associated with fossil fuel extraction, processing, and combustion. Under present technology, because solar energy is a diffuse, low intensity energy source, large scale solar energy collection complexes would require extensive land areas. In addition, because its intensity varies with time of day, weather, and season, solar energy must be stored or supplementary sources used during periods of little sun.

With few exception, all practical solar energy systems now in use are flat-plate collector systems. Materials, costs, and operational difficulties have prevented widespread application of focusing collector systems. Other potential applications are prohibitively expensive today. The silicon photovoltaic cell directly converts solar radiation to electricity using solar cells in satellites or in ground installations await development of less expensive solar cells. Large scale power plants using collectors, located in desert areas, have also been suggested. Another potential application in use of thermal gradients to extract the solar energy stored in surface layers of the ocean. The difference in temperature between surface and cold deep water can be used to generate electricity. A proposed site is the southeastern coast of Florida, where the Gulf Stream passes.

Of the many applications of solar energy, few are cost competitive with other energy sources at the present time. The following table shows the state of development of various applications. Many conceptual applications have very high capital costs and would appear not to be cost competitive even in the long term. These schemes would require large government research and development funds and subsidies. However, extensive application for solar power does exist today in home heating and cooling and water heating using relatively inexpensive collectors. The main obstacles to such systems are not economic or technological but rather institutional. Small energy complexes for homes and buildings also could conceivably be profitable in the near future.

Among potential applications of solar energy, residential heating and cooling and solar water heating have the highest chance of success, especially in the near future. Space heating and cooling is not as advanced as water heating. Solar power potential is very favorable in California, Florida, and the Southwest.

A recent study analyzed solar heating and cooling of buildings (Westinghouse Electric Corporation, 1974). The principal findings are outlined below. The major demand for heating and cooling and hot water arises from residential buildings and three types of commercial buildings: offices, schools, and stores. The solar systems that would best meet this potential market are solar heating only, solar-assisted heat pump, solar heating and cooling (using absorption systems). None of these systems is economically competitive with oil or gas systems on a significant scale. The initial investment is appreciably greater for solar heating and cooling systems than for conventional systems in all regions.

Solar heating only systems can first become competitive for residences in the California region in 1975 to 1980. By 1980, these systems can become competitive, primarily for commercial and institutional structures, in several regions. Solar heating and cooling can become cost competitive in most regions by 1985-1990. The market for solar hot water heating only can grow in several regions of the U.S., creating a volume demand for solar collectors.

Table 135
Present Status of Solar Utilization Techniques

Application	Status					
	Research	Development	Systems test	Pilot plant demonstration	Prototype plant	Commercial readiness
Thermal energy for buildings						
Water heating	X	X	X	X	X	X
Building heating	X	X	X			
Building cooling	X	X				
Combined system	X	X				
Renewable clean fuel sources						
Combustion of organic matter	X	X	X	X		
Bioconversion of organic materials to methane	X	X	X	X		
Pyrolysis of organic materials to gas, liquid, and solid fuels	X	X	X	X	X	
Chemical reduction of organic materials to oil	X	X	X			
Electric power generation						
Thermal conversion	X					
Photovoltaic						
Residential/commercial	X					
Ground central station	X					
Space central station	X					
Wind energy conversion	X	X	X			
Ocean thermal difference	X	X	X			

X indicates effort is underway but not necessarily complete.

(Source: National Science Foundation, National Aeronautics and Space Administration, p. 8, December 1972).

Solar energy economic feasibility will be largely determined by solar collector costs versus oil and gas prices. On the average, it will cost several thousand dollars more to equip a single-family residence with a solar system than with a conventional system. Retrofitting single-family residences is not likely to be economically feasible on a large scale. Retrofitting solar systems on larger buildings is approaching economic feasibility from a life cycle cost basis.

There is a gap between near term costs for solar systems and additional costs consumers would be willing to pay. Government programs and incentives will be required to close that gap (Westinghouse Electric Corporation, 1974).

Geothermal Energy Production

Geothermal energy is primarily heat energy from the interior of the earth. It may be generated by radioactive decay of elements such as uranium or thorium and friction due to tidal and crustal plate motions.

There are four major types of geothermal systems: hot water, vapor dominated, geopressured reservoirs, and hot dry rock systems.

Geothermal plants are smaller than conventional plants and require a greater amount of steam to generate the same amount of electricity. This is due to the fact that temperatures and pressures associated with geothermal areas are lower than those created at conventional power plants.

The greatest potential for geothermal energy in the U.S. is in the Rocky Mountain and Pacific regions; some potential exists in the Gulf Coastal Plain of Texas and Louisiana. The Geysers Field in California is the most extensively developed source of geothermal energy in the U.S. It has been producing power since 1960. Exploration efforts are also underway in the Imperial Valley, Salton Sea, Mono Lake, and Modoc County, California.

Within 20 years, geothermal energy may account for about 1 to 2 percent of total U.S. energy and about 5 percent of California's total energy consumption. The following table shows projected growth of geothermal power in California.

A number of gases are associated with geothermal systems and may pose health and pollution problems. These gases include ammonia, boric acid, carbon dioxide, carbon monoxide, hydrogen sulfide, and others. However, adverse air quality impacts are generally less than those associated with fossil-fuel plants. Also associated with geothermal systems are saline waters which must be disposed of. The manner of disposal depends on salinity and water quality. These saline waters must be isolated from contact with ground water regimes.

Land quality problems stem from disturbance due to construction of related facilities, and possible ground subsidence which in turn can cause structural failures and loss of ground water storage capacity.

Table 136

ESTIMATED GEOTHERMAL-POWER GROWTH IN CALIFORNIA*

	Megawatts				
	The Geysers	Imperial Valley	Other Areas	Total/ Year	Cummulative Total
Capacity at 12/31/71	184			184	184
Additional capacity:					
1972	106			106	290
1973	106	10		116	406
1974	106			106	512
1975	212			212	724
1976	212	200		412	1,136
1977	212	100	100	412	1,548
1978	212	100		312	1,860
1979	212	100	100	412	2,272
1980	212	100		312	2,584
1981	212	100	100	412	2,996
1982-1991				4,504	7,500

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* This estimate reflects only present development trend, not total state potential.

(Source: Wilson, 1973)

Combination of Some or All of the Above

Some of the alternative energy sources mentioned above could plausibly replace all OCS oil and gas that would be added to the national energy supply by means of accelerated leasing. Others would not plausibly replace all OCS oil and gas but could certainly replace some of it. In combination, alternative fuel sources which did not individually amount to very much might make a rather large contribution to national energy supply, perhaps even larger than that postulated for accelerated development of the OCS. Of course, were some such alternative unit of possibilities designed and implemented, the total environmental impacts of such a unit would be approximately equal to the sume of the impacts which would be associated with each individual fuel source in the unit.

Even if an incomplete, but still sizeable, substitution of other sources for OCS oil occurred, the net effect might still be, ultimately, to preserve some of the most environmentally hazardous OCS areas from development. Much would depend on the *sequence* in which OCS areas were to be leased, and the *rate* at which leasing would occur. These are issues to which we now turn.

G. Leasing at a Slower Rate

The present proposed schedule calls for considering lease sales in each of the 17 frontier areas by the end of 1978. The Department could choose to extend this process to some later year, however, like 1982 or 1986. Completing the process by 1982 would imply decelerating planning and leasing activities by about 50% (eight years to completion instead of four); correspondingly, completion by 1986 would imply deceleration by 67%.

Slowing the program rate would automatically entail a combination of consequences already discussed, namely higher imports or more conservation (for gone consumption) or greater reliance on non-OCS energy sources. It is, of course, impossible at this point to predict exactly what level of conservation would be joined with what mix of non-OCS energy sources in such a scenario.

Several advantages are claimed for decelerating OCS leasing activities, not all of which are environmental. Although a full discussion of the non-environmental issues would be out of place in an Environmental Impact Statement, we shall touch on them briefly because public comments on the draft EIS indicated substantial concern with these issues.

1. Readiness of the oil industry to undertake rapid exploration and development. It is often claimed that there is a shortage of drilling rigs and that the Department should therefore slow down while industry gears up. (See, for instance, EPA comments, Section IX)

This argument is incorrect for a number of reasons. First, drilling rigs are highly mobile, and many rigs now working overseas could easily be returned to United States waters. Secondly, no quantity of rigs can explore all possible drilling sites on the United States OCS simultaneously. The socially relevant objective is to have them allocated to the most promising sites first. This objective is assisted by broadening, rather than narrowing, the field of available sites. Thirdly, and most importantly, it is unrealistic to imagine that industry would build and store enough drilling rigs to manage rapid OCS exploration and then wait for OCS acreage to be leased. Rigs are too expensive for industry to risk the likely delays. Industry can undertake such expenditures only after the acreage has been leased or firm plans to lease have been announced. The drilling rig "shortage" is better thought of, therefore, as an inevitable "lag" between events that make rig construction presumptively profitable (leasing) and the actual delivery of the completed rig.

2. Rapid leasing might depress the level of bonus bids. The Department has long had a policy of rejecting bids for tracts which do not come close enough to internally produced estimates of fair market value. This policy will continue. The concern here is that rapid leasing might lower the true fair market value by lowering the expected future prices of oil and gas. Theoretically, this is a valid concern. However, a guiding principal of the leasing program is orderly resource development. Flexibility to adjust

the program at any point is provided by two salient management tools. The first is the ability to decide not to hold any particular sale or to postpone a sale. The second is the ability to prescribe the amount of acreage to be offered in any lease sale. Price effects can be altered through these mechanisms, although whether the Government should make these decisions is a question of public policy, and beyond the scope of this discussion.

3. The longer we wait, the greater the likelihood that something will turn up that makes OCS development less attractive (if not wholly unnecessary). In particular, the OPEC cartel might collapse; new oil discoveries in foreign countries or oceans (or even in portions of the U.S. OCS) may glut the world oil market; or new breakthroughs in coal synthetics, solar energy, hydrogen, geothermal, etc., might occur. The argument for delay on these grounds deserves serious consideration. One should note, however, that its validity depends on three premises: (1) at least one of these helpful events will occur in a longer time frame (8 years or 12 years, say) that would not occur in the shorter (4-year) proposed time frame; (2) that the event will be of such magnitude that it turns OCS oil and gas development from a program with expected net benefits (if indeed it were shown to have expected net benefits) to one with net costs to society; (3) nothing will happen to make OCS development _increasingly_ attractive.

4. Environmental consciousness needs more time to come into its own. The argument here is that the higher value we have all learned to place on the environment in the last five or ten years is likely to get higher still. The case for delay on these grounds necessarily rests on the belief that the new social consciousness necessary to appraising the net effects of OCS development as a cost rather than a benefit will be attained in the longer time frame (say, 8 or 12 years) even though not in the proposed 4-year time frame.

5. Delay will permit more environmental study and land-use planning. Baseline environmental studies are already under way in a number of OCS frontier areas. Obviously more time for these studies would produce better results (more field seasons for sampling, more time for analysis, etc.). The question here is how much is enough.

The Department's own environmental analysis process, as well as the current procedures for implementing the National Environmental Policy Act, mandates that an EIS be written on every proposed lease sale. One possible conclusion from such an EIS, especially in a frontier area, would be that more study--and hence delay-- was needed before a final decision could be made. This sort of case-by-case justification for delay will probably be more relevant, and hence more persuasive, than an argument for delay in the overall leasing rate.

Public comments on the draft EIS indicated concern lest the coastal states not have sufficient time to plan for probable onshore social and economic impacts. The Department shares this concern. Yet there is reason to suppose that in very few states will this present a problem. Coastal Zone Management plans are presently being prepared in most coastal states. Most will be ready by the summer of 1977. Leasing schedules produced by the Department serves a function of giving the States a clearer idea when their coastal zone plans, and any auxiliary planning and regulatory mechanisms, will be needed. In most cases, exploration activities take 1-3 years before production can get underway, and few if any state plans and controls will actually be needed before 1977 or 1978. In cases where a specific problem persists, this problem should be identified in the site-specific EIS, which might then lead to a recommendation for further delay while plans were completed.

6. Learning from experience. Presumably it could be helpful to delay leasing while pilot studies were conducted in certain OCS areas, the results of which could be applied to other areas. Comments submitted by L. C. Meeker for the Sierra Club and the Natural Resources Defense Council suggested this procedure explicitly for deep water technology and implicitly for other natural hazards problems like ice. This argument has merit in theory, even though it is impossible to evaluate it by direct experience. It should be noted that it could have a definite implication for the sequencing

of lease areas as well; for unless the sequence of development activities was ordered so that industry could in fact proceed from the most hospitable to the least hospitable environments, delay on these grounds would be pointless.

E. Leasing Frontier Areas in a Different Sequence

The proposed four-year schedule orders the sequence of lease sale areas primarily according to the likelihood of their being able to contribute substantially to meeting national energy needs. Other ordering principles are also possible, however. In this section we consider the differential environmental impacts of sequences built on these other ordering principles under two different assumptions about the overall leasing rate: that the program ends in 1978 (as proposed), and that leasing might be slowed by 50%, to end in 1982.

1. A scheduling principle strongly advocated by a number of groups and organizations is, in effect, to "save the worst for last." CEQ and EPA, for instance, have strongly objected to the Gulf of Alaska, which CEQ rated as the most environmentally hazardous lease area, being scheduled for lease sale consideration in 1975. They have argued that it should be deferred until the end of the lease schedule. Comments from Southern California citizens and governmental groups have argued that Southern California should similarly be held in reserve.

One could propose many different leasing sequences built on the principle of saving the worst for last. In Chapter III, Table 123, it was shown that different assumptions about natural hazards and the scale of eventual production could produce extremely divergent estimates of the amount of potentially significant spillage in a region. If the definition of "worst" took account only of the parameters incorporated in Table 123, it is clear that the Chukchi and Beaufort Seas would be "worst" under all assumptions. The Gulf of Alaska, Santa Barbara, and Cook Inlet would follow at some distance. Behind them would come Southern California, Bering Sea and Bristol Bay. In all cases, the Gulf of Mexico areas, the Atlantic coast, and the northern Pacific coast region are relatively the lowest hazard.

Taking account of oil spill risks alone, however, is inappropriate. The regions differ quite a bit by resource values. The highlight features of each region--the most valuable and vulnerable environmental resources--were indicated in Chapter III, Table 119. However, it is impossible to express the value of these different resources in commensurable units. That is, we cannot readily say, for example, that the commercial fishery resources offshore New England are of greater or lesser value than the recreational and aesthetic resources in Southern California or the immense biotic and ecological resources of the Bering Sea Shelf. For the sake of discussion, however, let us consider the two candidate schedules described in Table 137.

Table 137

Schedules Based on Principle of "Save the Worst for Last"

		A	B
Earliest	I.	Gulf of Mexico and Northern Pacific Coast	Gulf of Mexico and Northern Pacific Coast
	II.	All Atlantic areas	South Atlantic
	III.	Southern California; Cook Inlet	North and Mid-Atlantic; Southern California; Cook Inlet
Latest	IV.	All Alaska areas except Cook Inlet	All Alaska areas except Cook Inlet

It cannot be overemphasized that these two alternative schedules are not derived from some precise scientific methodology. Indeed, the several lease sale areas are clustered into only four distinct groups partly in order to avoid giving the misleading impression that the basis for such a ranking effort is in any sense objective or precise. Value judgments, as well as empirical judgments, do play a large role in the ranking.

The rationale for designating the Alaskan areas as the "worst" and therefore entering them at the "latest" points of the alternative schedule, is that most of the Alaskan areas are beset by natural hazards of unusual magnitude, as can be seen from Table addition, we were particularly concerned about the enormous biological significance of the biota in the Bering Sea, the prospects of onshore development in the midst of subsistence-level villages on the Kenai Peninsula and elsewhere along the southern Alaskan coast, and the large commercial salmon and crab industries in the Gulf of Alaska which might be adversely affected.

Of principal concern in Southern California and Santa Barbara were the recreational and aesthetic resources. The potential spillage rates under the "worst case" assumptions in Table 123 also caused some concern.

It was reasonably easy to rank the Gulf of Mexico at the lowest end of the potential hazards spectrum and to place it at the top of both alternative schedules. There is a two-decade history of Federal leasing in the Gulf of Mexico OCS. Known environmental impacts in the area do not appear to be intolerable. Industry and the public, in Louisiana and Texas at any rate, have long experience with offshore oil and gas development.

The Atlantic Coast areas were the hardest to rank. Schedule "A" groups them all together and locates the entire cluster between the Gulf of Mexico areas and the Southern California areas (and Cook Inlet). One could view the North Atlantic in a more adverse light, however, if one were extremely concerned about the unstable ocean bottom conditions in that area and/or the potential (but probably mitigatable) impacts on commercial fishing. A case could also be made for regarding the Middle Atlantic as relatively more hazardous than either the South or the North Atlantic if one were extremely concerned about the importance of recreational resources represented by the beaches in the region. Schedule "B" indicates a schedule in which the possible concerns about both areas would be at a maximum.

How would the environmental impact of a sequence based on "saving the worst for last" compare with that of the proposed sequence? If the four-year timeframe were maintained, there would probably be no difference in impact. Both sequences would, to be sure, have impacts, but they would very likely be about the same magnitude. This is essentially because the basic decision process by which the Department assesses the desirability of leasing in any given area is likely to come up with the same conclusion in 1978 as it would have in 1975. It is not likely that the world will change sufficiently in the next four years to make the results of a properly done appraisal in a given area come out negative (against leasing) in 1978 when it would have been affirmative (for leasing) in 1975. Stretching out the leasing rate to fill an eight year rather than a four-year timeframe might well lead to a different outcome, however. We have already mentioned the argument for delay on the grounds that "something might turn up" (sec. VIII.F.3.). This argument makes the most sense if the leasing sequence is designed on the principle of "save the worst for last". Correlatively, the argument in favor of this principle makes more sense if it is combined with the "something might turn up" argument for delay.

2. A sequence based on the principle of leasing to learn from experience, as described above, might take account of four distinct natural hazards or problems: ice, deep water, seismicity, and storms. Seismicity should probably be excluded from further consideration, however, on the ground that high-impact seismic events would be so rare that learning from experience might take a long time.

To learn about ice problems, it would probably be wise to lease and develop in the Beaufort and Chukchi Seas early, so as to permit technical experimentation there before the moving to the ice-impacted portion of the Bering Sea Shelf (Norton Basin), which is so rich ecologically. (From this one example it is obvious that there is a potential incompatibility between the principle of saving the worst for last and the principle of leasing to learn.)

To learn about storms one would presumably wish to continue experimenting in the Gulf of Mexico, and possibly even the South Atlantic before progressing to the Gulf of Alaska.

To learn about deep water, the most plausible strategy would be to continue experimentation in the deeper portions of the Gulf of Mexico, while reserving till the end of the schedule leasing deep water tracts offshore southern California. Where the deeper tracts in the Atlantic would fit into this sequence would depend on one's relative preferences concerning the value of the South Atlantic environmental resources compared to those of southern California, and also on how much could be learned from the Gulf of Mexico alone.

One problem with this "leasing to learn" approach is that the prospective environmental benefits of learning from experience are hard to determine and may be relatively small. A second problem is that it is necessary to lease in areas attractive to industry if learning is to take place. The Department has in the past found it difficult to lease deep water tracts in some areas of the Gulf of Mexico. A third problem is that delaying the leasing schedule might be a very inefficient way to develop the relevant experience. A more efficient way would be to work through regulations and operating orders written after leasing and exploration are concluded but before development is begun. Regulations and operating orders are not, to be sure, a perfect substitute for stipulations written into the lease itself. But they can probably be made to serve. In any case, it seems probable that improving our ability to write better lease stipulations under the "lease to learn" schedule would not occur in the four-year timeframe. Even an eight-year schedule might be too rapid to permit industry and government to solve the Arctic ice problem.

I. Two-Stage Versus One-Stage OCS Development

A major variation on the presently proposed leasing program which might have favorable implications for environmental protection would be to loosen the connection between exploration and production. Calculations concerning the balance of expected benefits and costs from leasing in a given area normally rely on rather speculative estimates of oil and gas resources to evaluate the benefit side. If exploratory activity were to discover only modest resources, however, an initially affirmative decision might prove to have been mistaken. In such cases (which might, admittedly, be infrequent), to proceed with development would not be in the public interest. In effect, the two-stage strategy of OCS development seeks to achieve the information benefits of rapid exploration while reserving for a subsequent, and presumably better informed time, the decision on the question of whether production benefits do or do not exceed the environmental costs. (Inter alia, see comments by National Resources Defense Council.)

If such a plan were adopted, government decisions concerning the optimal rate and sequence for development would be relatively straightforward. Basically, development would be permitted in every area where the benefits of development were clearly positive. The exact details of how to carry out the development in each of these areas, and at what precise rate, could be left, by and large, to the private purchasers of development leases. In areas where the effects of development were clearly negative, no development would be permitted. In areas for which the benefit-cost calculus was equivocal, delay--pending further study or simply "waiting for something to turn up"--would be the appropriate choice. In a few instances it might be desirable for the government to defer development in some areas while hastening it in others in order to facilitate learning from experience.

If production were left to private industry under such a plan, who would conduct the exploration? One possibility is for government to do the job, but this approach has serious drawbacks. It is seriously affected by the tendency of official agencies to be quite risk-averse. An impressive number of the world's larger oil fields have been discovered by wildcat explorers defying "the conventional wisdom," e.g., returning to explore fields condemned as non-producers by previous explorations. It is hard to imagine government agencies, or congressional appropriations committees, venturing large amounts of taxpayer dollars on such unorthodox activities.

A second possibility is to continue with the current lease sale system with modifications indicated in the notice of sale and the lease forms. The Secretary of the Interior would state that he reserves the right, through orders to suspend operations, to forestall development on a tract in the interest of conservation. This procedure would introduce additional uncertainty into a prospective buyer's calculations, and it would therefore reduce bonus bids somewhat. It is not likely that this extra uncertainty is very large when juxtaposed against all other sources of uncertainty, however. In addition, if there were a slight decline in the bonus bids, this would merely reflect a shifting of some of the social costs of OCS development back to the public at large through lower revenues to the Federal treasury.

Whether exploration were to be conducted by government or private industry, actual development would be conducted by the private sector. Prior to this phase, the Department of the Interior would have to approve industry development plans. In the past these plans have been submitted, reviewed, and approved on a tract-by-tract basis. It can be argued that if a formalized separation of exploration and development decisions is to have any substance, this piecemeal approach would have to change. The Department would have to require mandatory unitization of development for OCS fields, or it would have to adopt an administrative policy of not approving any development plans on a field until such plans have been received for a substantial number of active leases on the field.

J. Alternative OCS Exploratory Programs

1. Description

a. Special Limited Leasing in Frontier Areas with Requirements for Prompt Unitized Exploration.

Tracts of flexible size and shape that correspond to geologic structures could be offered in frontier regions. Such leasing would encourage the full development of geologic structures as opposed to limiting development to tracts of 3x3 mi. blocks. Advantages would include the following: no other changes in regulations required, procedures are well established, large areas tend to reduce duplication of exploration effort, large size of tracts will encourage most profitable prospects to be drilled first, large tracts will promote efficient single-company ownership and operation of fields. Disadvantages include the following: most profitable fields are not always largest fields, dilutes total exploration effort by follow-up development drilling, bonus bids may be even larger and more counter-productive in terms of capital demand, and such a change would require an alteration in the law.

b. Leases for Exploration only - Develop Lease upon Discovery (If Leasing Scheduled for Area)

Exploratory oil and gas leases on the OCS except in the Gulf of Mexico and the Southern California Continental Borderland have been suggested. The leases would be issued to the highest responsible qualified bidder by competitive bidding. The lease would be for a term of one year and would extend over a set number of acres. An exploratory oil and gas lease would not authorize the production of oil and gas from the leased area except for testing the scope and quantity of any oil and gas discovered. If oil and gas are discovered on the lease during the life of the lease, the company holding the lease shall, without competition or the payment of a bonus, be entitled to a preference right lease covering the discovery. The preference right lease would require a payment of royalty as well as a payment of a share of net profits which would be established by the Secretary of the Interior at the time of issuing the exploratory lease.

c. Federal Exploratory Drilling Program

The Federal Government could conduct its own drilling program on the frontier areas of the Outer Continental Shelf. Such an effort would have to be directed towards the most favorable geological structures since the Government does not presently have the capacity to study all the smaller structures. Even a limited effort by the Government, most likely the U.S. Geological Survey, would put a strain on personnel, procedures for contracting and hiring, and general organizational structure. It would be necessary to immediately contract offshore rigs or else they will be unavailable, which might already be the case. A hostile reaction might be encountered from industry which could result in legal delays. Then of course, industry would also do its normal exploration and research resulting in a duplication of effort. About the only advantage that a Federal Exploratory Drilling Program would be the added knowledge the Government would receive, and perhaps could better evaluate the hydrocarbon resources to be leased.

d. Off Structure Stratigraphic Drilling

1. Federally Conducted

The Federal Government could conduct an off structure stratigraphic drilling program for the purpose of obtaining stratigraphic data. The intent would not be to discover hydrocarbons, but to learn more about the regional geology of the Outer Continental Shelf.

The basic idea of an off structive drilling program is good, but a Federally conducted program would not be practical under existing manpower and budget constraints.

2. Privately Conducted

There is an off structure stratigraphic drilling program presently being conducted privately with Government cooperation off the coast of Texas. This is the only area where such a program is taking place. Stratographic drilling will be included in the proposed U.S.G.S. permit system allowing early aquisition of geological and geophysical information. (See attachments)

K. Alternative Lease Bidding Systems

1. Description

a. Royalty Bidding with Fixed Bonus

Under royalty bidding leases would be awarded to the firm that pledged to the Government the highest percentage of future production for an individual tract. Therefore, the bulk of Federal revenues would accrue from royalty payments made if and when production occurred. For the leaseholder this means that Government payments -- aside from a nominal fixed cash bonus -- depend on production. If the leased property is not productive, payments to the Government are not made. Royalty bidding thus means that the risk of an OCS enterprise is shared by both the Government and the leaseholder.

This major advantage of the royalty payment scheme has another side however. Royalty payments, taken off the top, effectively limit leaseholders to receipt of only a fraction of the market price for oil and gas. Depending on the size of the winning royalty bid, the great majority of production could belong to the Government. Production may thus be foregone even when market prices are at a desirable level. Oil and gas wells could be shut down prematurely leaving substantial reserves in the ground To protect against this hazard, royalty reduction stipulations have been established that enable royalty obligations to be diminished over time. These regulations involve conditions that the leaseholder must fulfill prior to the granting of a royalty reduction. The stipulations for this rate reduction also limit the lessee's rate of return. It is believed that these provisions will help prevent early abandonment of OCS leases. (These regulations appeared in the Federal Register of July 30, 1974).

Unlike the cash bonus plan, royalty bidding may sometimes foster lease abandonment in those instances where exploration reveals that the original estimates of production revenue were too high. Under cash bonuses, investment in production is only a fraction of the overall investment on which the normal rate of return is originally calculated. If production revenues estimates are revised downward there is still a good chance that return on production investment alone will be in excess of that obtainable by putting the money elsewhere.

This is sometimes not the case with competitive royalty bids. A royalty bid is calculated so that the firm will retain just enough out of expected production revenues to yield a normal rate of return on production investment. If exploratory drilling causes a downward revision in estimated production revenues, a normal rate of return on production investment may no longer be obtainable. Since production investment is the major component of total investment under royalty bidding, and since the decision to invest in production is made after exploratory drilling, a downward re-estimate of production revenues under royalty bidding may sometimes encourage firms to abandon leases for more attractive production options. The problem is not really this clear cut because firms will also incorporate risk into their royalty bids. However, lease abandonment is more likely under the royalty rather than the cash bonus methods.

It should also be noted that the most efficient firm may not get the lease under royalty bidding. Any firm can bid a high royalty. If an irresponsible bidder is awarded the lease there may be significant adverse environmental consequences. In the event of a spill or blowout, the firm may lack the resources necessary to prevent widespread damage. However, in the event of such an emergency, the Government could intervene and cleanup under the Regional or National Oil and Hazardous Substances Pollution Contingency Plan.

b. Net Profit Sharing

Two different lease bidding systems fall under the net profit sharing genre. Under a net profit bidding plan, a minimum bonus would be set to discourage irresponsible bidders and firms would compete on the basis of their pledge of a percentage of future net profits to the Government.

As with royalty bidding, payments to the Federal Government would be contingent upon production -- thus shifting some of the risk of OCS development to the Government. Unlike royalty bidding, the production based payment should not by itself induce lease abandonment or premature well shutdown, because the net profit payments will flow from income above and beyond that needed for a normal rate of return. However, there is no guarantee that the most efficient firm will win the lease. Inefficient firms, bidding a high percentage of very small expected net profits, could conceivably get all the leases under this system. The Solicitor's Office of the USDI has indicated that a bidding system of this kind is possible under the current law if:

- regulations are changed to define royalties as a percentage of something equivalent to net profits;
- firms bid on the basis of the royalty rate (percentage of net profits) they are willing to pay.

Profit sharing, the other lease bidding system in this category, would employ cash bonus bidding -- but a fixed percentage of net profits would replace royalty payments. If profit sharing is to be an improvement over the present system, then it should provide for a reduction in the level of the "front-end" bonus bid while simultaneously preventing inefficient firms from winning leases. This will occur if the net profit payment exceeds the expected royalty payment in force under current ground rules. Since the lease will be awarded on the basis of competitive bonus bidding, the winning firm will be the one that places the highest net value on the lease at the present time. The efficiency of this firm is assured because this firm's expected net value is the highest after costs have been covered and profits shared.

The advantages of a net profit sharing system are realized only when:

1. "Net profits" are defined as net income on property after taxes.
2. Net profit payments are a share of "net profits" involving a return on investment in excess of a normal rate of return.

These two conditions are not valid under current tax law. Net profit payments must be calculated prior to tax liability beacuse they are considered as deductions from gross income on property. The second condition above requires a definition of exploration and capital costs distinct from that now used for tax purposes.

c. Deferred Bonuses

Under a deferred bonus system, firms still compete on the basis of bonus payments but with the understanding that the bonus payment will occur over time rather than in one lump sum. For this system to conform to the present law, the bonus payment must be defined as the rental payments during the first five years of the lease. Under this system, the equivalent to current bonus payments would be six times what the firm bids -- the bonus payment plus the first five rental payments.

There is really no shifting of the risk in OCS development from the leaseholder to the Government under deferred bonuses. Payments to the

Government are made during the lease's non-productive years and regardless of whether or not production ever takes place.

The advantage of deferred bonuses is that they provide relief to the smaller firm. Such a firm, which might be an efficient and responsible producer, may be at a competitive disadvantage under the current system because of the difficulty it will encounter in trying to assemble the huge sums --- from either retained earnings or the money market -- now needed to make cash bonus payments during the first year of the lease. The relief is in the form of spreading out the cash flow involved in paying for the right to explore and develop OCS leases.

L. Alternative Management and Supervisory Systems

1. Description

a. Place All Management and Supervisory Functions Under One Agency

It has been suggested that many of the management and supervisory problems of OCS leasing (and energy policy in general) would be reduced by assembling all jurisdictional offices in one agency. The most frequently mentioned name for such an agency is the Department of Energy and Natural Resources (President Nixon proposed this Department in his Energy Message of 1973). The intended result of such a consolidation is a reduction in the necessity of interagency communication and division of responsibilities among agencies. The multi-agency responsibilities were outlined in Section I of this statement. There is considerable difficulty and competing interest in multi-agency control of programs. However, the present system, with BLM having the lead in management aspects and USGS having the lead in supervisory aspects, has developed over time to a workable relationship between those two groups and the other groups having responsibilities.

On the other hand, it has also been suggested that the present separated system is better than any proposed consolidation, simply because the divided responsibilities insure checks and balances on the program. See next section.

b. Divide Management and Supervisory Functions Between or Among Agencies

One major criticism of the present leasing system has been that there is an inherent conflict within the Department of the Interior because the Department, under the OCS Lands Act and NEPA, must both promulgate programs and then objectively evaluate them. In the leasing program, this conflict centers on the fact that BLM is the lead agency in proposing sales (site and size) and in writing environmental impact statements concerning those sales. It has been suggested from several sources that these functions should be separated, even to the extent of having one function in one agency and the other in another agency (e.g., leasing in Interior, environmental assessment in Commerce under NOAA). The Environmental Protection Agency has also been mentioned as the possible environmental assessment agency. Presumably this separation would reduce the possibility of parochial interest in programs and insure that multiple uses of the OCS would be more equally considered.

The possibility of conflict was considered in the early stages of the impact statement program soon after the enactment of NEPA in 1969. This possibility is mitigated by the wide distribution of impact statements for Federal, State and public review and comment.

c. Consolidate Present Leasing Functions of BLM and Present Supervisory Functions of USGS Under One Bureau in Department of the Interior

This alternative is essentially the same as in a. above. Closer coordination might be possible with such an arrangement, especially in the pre-sale stages and in evaluation of tracts for lease. The geophysical information gathered by industry is purchased by USGS and is held on a proprietary basis. Personnel in BLM generally do not see this material and do not have the expertise to evaluate it. The USGS provides interpretation of such data to BLM for pre-sale evaluation and tract selection. This proposal has merit from the standpoint of BLM being more aware of operating practices and supervisory procedures, but the separation of functions was instituted to permit independent supervision of the program.

d. Same System as Proposed Action But With Increased Funding and/or Personnel

It is felt in some quarters that increased funding and/or personnel can solve nearly all problems. The OCS leasing program has been expanding rapidly in the last few years and this has necessitated larger budgets and staffs both for BLM and USGS. Significant funding has been granted BLM for the conduct of the environmental baseline and monitoring studies outlined in Section I. of this statement. It has also been mentioned that the present staffing and funding for BLM appear adequate for management of this proposed action, and that USGS' budget requests for increased staff should be adequate to supervise the program in the shore term. Full scale development under an accelerated schedule of leasing will take several years, however, a fact that allows necessary adjustments of fiscal and staffing needs to be made in the future as conditions then require.

e. Promulgation of OCS Orders for Frontier Areas

As each frontier area is opened, OCS Orders will be written, at least in draft form, for inclusion in the EIS for the first proposed sale in each area. These OCS Orders implement the requirements of the regulations contained in Title 30 CFR Chapter II Part 250 "Oil and Gas and Sulphur Operations in the Outer Continental Shelf".

The OCS Orders are revised from time to time to reflect advances in technology and overall knowledge of weather, sea and geologic conditions in the area covered by the orders.

IX. Consultation and Coordination with Others

IX. CONSULTATION AND COORDINATION WITH OTHERS

INTRODUCTION

This section presents an account of the consultation and coordination processes involved in the preparation of the draft environmental statement (DES), which was made available to the public on October 18, 1975, the period of review of the DES, and the steps leading to preparation of the final environmental statement(FES). All review comments received by Federal and State agencies charged with enforcing environmental standards are attached, and where appropriate, the disposition of pertinent comments leading to preparation of the FES are indicated.

A. Preparation of the Draft Environmental Statement

1. Federal Participation

In the preparation of the DES, data and review comments were informally solicited from the following Bureaus and offices within the Department of the Interior.

Office of Environmental Project Review
Fish and Wildlife Service
National Park Service
Bureau of Outdoor Recreation
U.S. Geological Survey
Bureau of Mines

In addition, the following agencies and Departments are consulted during the preparation phase of environmental statements on specific leasing proposals, although the present EIS is not a specific leasing proposal.

Federal Energy Administration

Environmental Protection Agency

Energy Research and Development Administration

Treasury Department

Department of Transportation

Department of Commerce

Federal Power Commission

Department of Defense

2. State Participation

In the preparation of the Draft Environmental Statement, coastal States were not formally requested to submit information or comments for inclusion in the DES. Numerous position papers prepared by the States were consulted for environmental background information, several Governors Conferences were held which produced information related to this proposed program, and the various issues of environmental consequence were debated in the media. Active State involvement was solicited at public hearings and in review of the program as it was presented in the DES. All State comments, either formally submitted documents (attached) or testimony at public hearings, were considered in the preparation of the Final Environmental Statement.

B. Coordination and Review of the Draft Environmental Statement Leading to Preparation of the Final Environmental Statement

After the draft statement was prepared, copies were made available to Federal and State governmental agencies and the public. Comments and views were solicited from these agencies which have some mandate for enforcing and developing environmental standards.

In addition, comments and advice were solicited from the public at large, through formal and informal correspondence, and from testimony that could be submitted at public hearings held in Anchorage, Alaska on February 3 and 4, 1975; at Beverly Hills, California, on February 6, 7, and 8, 1975; and at Trenton, New Jersey on February 11, 12, 13, and 14, 1975.

1. Federal Agencies

The following section contains all comments of Federal agencies from whom review comments of the draft environmental statement were received. Where appropriate, the disposition of their comments is indicated and any unresolved issues are identified. Remarks concerning disposition are to be found immediately following each agency's comments, which are reproduced verbatim. In this way, it is hoped that the department's responses to many of the issues raised can be easily located and oriented to the agency that brought the issue to our attention in the first place.

FEDERAL ENERGY ADMINISTRATION
WASHINGTON, D.C. 20461

13 FEB 1975

OFFICE OF THE ASSISTANT ADMINISTRATOR

Mr. Curtis J. Berkland, Director
Bureau of Land Management
United States Department of the Interior
Washington, D.C. 20240

Dear Mr. Berkland:

This is in response to your request for our review and comments on the draft environmental impact statement, "Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf."

Our comments are presented according to subject.

Emphasis of Statement

It is indicated in the statement that insufficient physical data is available to predict accurately the environmental impacts of increased OCS leasing. It is proposed that site specific impact statements be prepared when leases are prepared for specific sites. We agree with this approach and think that less attention should be given to the description of the physical environment. We believe a more important area to discuss is the management and supervisory aspects of the proposed program and would like to see it expanded. For example, in the discussion of final tract selection (p. 28), the criteria considered should include:

(a) environmental impact of the proposed site;

(b) the geographical proximity of refining and distribution pipeline facilities;

(c) an analysis of the interaction of offering such a tract of lease in light of conservation programs which restrict domestic consumption.

We think that these factors should be explicitly named as criteria.

Secondary Impact of Offering New Leases

The statement does not consider in adequate detail the secondary impact of the proposed action. For example, the environmental impact of Alaskan or Pacific Northwest Oil Production on the Northwest will be most visibly seen in the refining and distribution facilities erected to accommodate increased production. The environmental impact of major pipeline construction; deepwater ports or increased tanker traffic would be significant to the Northwest. In light of this we believe that the discussion of irreversible and irretrievable commitments of resources on page 322 of Volume 2 should be reevaluated.

Timetable for Development

The timetable for development as stated on page 69 of Volume 1 does not explicitly include a consideration of the progress of state and national conservation programs in ameliorating the need for accelerated offshore leasing, especially in areas where the probability of adverse environmental impact is great.

The discussion of energy conservation on page 380 of Volume 2 is too generalized and is not compared to present and proposed OCS leasing criteria identified in Volume 1.

Interference with Commercial Fishing Operations

Interference with Commercial Fishing Operations on unavoidable adverse environmental effects of new OCS leasing is not discussed in sufficient detail on page 311 of Volume 2. In particular, the statement should consider the impact of near-shore drilling near estuaries where the largest and perhaps, most lucrative sedimentary deposits appear in the form of submarine fans. The impact of such activity would have a detrimental effect in the form of increased lenitic turbidity and hydrocarbon pollution which would disrupt pelagic reproduction as well as harming lenitic organisms such as oysters and crabs upon which commercial fishing depends. In addition, commercial and sport fishing for anadromous species (salmon in particular) occurs near these estuarine areas.

We hope that our comments will be helpful to you in the preparation of the final impact statement and in your future consideration of the proposal.

Sincerely,

Roger W. Sant
Assistant Administrator
Energy Conservation and Environment

Federal Energy Administration (FEA)

The FEA submitted several comments and suggestions on various aspects of the program. These are addressed in turn.

Disposition

Emphasis of Statement

From the points raised, there is apparently some confusion regarding the Department's use of the word "tract." Tract selection is the process of culling industry and private nominations of tracts of submerged lands (approximately a 3 by 3 mile square) which they would like to see included in a lease sale offering. The culling process entails reviewing summary resource reports prepared by the Fish and Wildlife Service (FWS) and the National Oceanic and Atmospheric Administration (NOAA, through the National Marine Fisheries Service), as well as other environmental and technical information. However, tract selection in and of itself has no environmental impact; it is a preliminary screening of nominations by BLM and USGS to decide which tracts to begin environmental analysis upon. The entire lease offering is then evaluated for environmental impact; socio-economic data generally includes information on existing refinery and pipeline facilities. Conservation programs are treated as alternatives to the proposed action. This final EIS contains considerably less superfluous environmental information and focuses more the management aspects of the program.

Secondary Impact of Offering New Leases

Environmental impacts are structured somewhat differently in this final EIS. Pipeline construction and tanker traffic to handle production are treated as primary impacts and evaluated on an area-by-area basis. Refinery construction is a difficult topic to discuss; however, the case is made in Section III on Impacts that accelerated OCS development would have some siting impacts that would not occur if we simply increased our oil imports. Section VII on Irreversible and Irretrievable Commitment of Resources has been modified.

Timetable for Development

A consideration of the results of conservation programs since the Arab embargo is now included in Sections I and VIII, based primarily on the results and predictions of the Project Independence Blueprint.

Energy conservation is discussed in more detail in Section VIII on Alternatives; the costs of conservation on a National scale are also presented.

Interference with Commercial Fishing Operations

This interference, which would be wholly new in frontier OCS areas, is discussed in Section III on Impacts and in Section V on Unavoidable Impacts. Potential impacts on nearshore fishing and estuarine shellfish are discussed in the same sections.

FEDERAL POWER COMMISSION
WASHINGTON, D.C. 20426

DEC 17 1974

Department of the Interior
Bureau of Land Management
Division of Minerals Environmental Assessment (730)
Washington, D. C. 20240

Gentlemen:

We appreciate the opportunity to comment on your draft environmental statement concerning the proposal to increase Outer Continental Shelf (OCS) oil and gas leasing to 10 million acres in 1975. The Commission is actively directing its attention and efforts toward those regulatory actions which will improve the current imbalance between natural gas supply and demand, and has taken a number of steps to stimulate exploration and development in addition to other actions designed to bring market demands more nearly in line with available supplies. We view the proposed increase in OCS acreage to be made available for leasing as having the potential to greatly improve the energy supply situation, but also recognize the importance of a balanced approach which will allow the development of raw energy supplies to meet the nation's social and economic objectives while at the same time giving full consideration to environmental issues.

The Commission staff has reviewed the draft environmental statement and its comments are enclosed for your consideration. Based upon a review of your statement and the staff comments, we conclude that a balancing of the national interests supports instituting the proposed increase in the OCS acreage offered for oil and gas leasing.

Sincerely,

John N. Nassikas

John N. Nassikas
Chairman

Enclosure
Staff Comments on Draft Environmental Statement

DEC 17 1974

STAFF COMMENTS ON DRAFT ENVIRONMENTAL STATEMENT PROPOSED INCREASE IN ACREAGE OFFERED FOR OIL AND GAS EXPLORATION AND DEVELOPMENT ON THE OUTER CONTINENTAL SHELF

On October 25, 1974, the Bureau of Land Management, United States Department of the Interior, circulated for comments a draft environmental statement (DES) covering a proposal to increase the annual amount of land leased for oil and gas exploration and development on the Outer Continental Shelf (OCS) to 10 million acres in 1975. The OCS areas tentatively designated for lease sales during 1975 are South Texas (3 million acres), Central Gulf (2 to 3 million acres), Southern California (1.5 million acres), Cook Inlet (2.5 million acres), and frontier areas of exploration (unknown acreage) in the Gulf of Alaska and Middle Atlantic portions of the OCS. It is estimated in the DES that the proposed 10 million acres could eventually produce up to 50 million barrels of oil and up to 250 trillion cubic feet of gas.

In view of the fact that the proposed action is designed to expand domestic energy supplies, the staff recommends that further discussion of the nationally deteriorating gas supply situation be provided in the DES. Reserve data provided by interstate pipeline companies indicate declines in proven gas reserves of 3.1, 7.4, 14.0, 12.2, and 14.5 trillion cubic feet for the years 1968, 1969, 1970, 1971, and 1972, respectively. 1/ At the end of 1972 the reserves of these companies totaled 146.9 trillion cubic feet, a decline of 26 percent below the peak level of 198.1 trillion cubic feet of proven gas reserves at the end of 1967. 2/ The inability of the currently available gas supply to meet customer demands has led 42 major and 2 smaller interstate pipeline companies to impose net total curtailments of 1.36 trillion cubic feet during the period September 1973 through August 1974. 3/

1/ Federal Power Commission, National Gas Survey, (Preliminary Draft), Washington, D. C., 1974.

2/ Ibid.

3/ Federal Power Commission, News Release No. 20849, Washington, D. C., November 15, 1974

For the period September 1974 through August 1975, net total curtailments are projected to total 2.36 trillion cubic feet, a 73 percent increase over the new total curtailments of the preceding year. 1/ For the winter period of November 1973 through March 1974 net total curtailments amounted to 0.44 trillion cubic feet. For the 1974-75 winter period a net total curtailment of 0.92 trillion cubic feet is projected, which is 107 percent higher than the net total curtailment of the previous winter period. 2/

Due to the severity of the curtailment situation, the Commission has requested additional data from interstate pipeline companies regarding curtailments to individual customers during the coming winter period and the type and amount of alternate fuels which they could utilize. An initial compilation of the curtailment data by company, state, and region was developed in a staff report dated October 4, 1974. 2/ This report will be updated in the near future. An additional report containing alternate fuel data was circulated on November 27, 1974. 4/ Both of these reports have been furnished to State and Federal energy offices and other interested parties.

It should also be emphasized in the DES that after the granting of the Federal leases in the petroleum frontier areas such as the Atlantic OCS a considerable time period will inherently be available for the resolution of problems associated with the environmental impact of production before on-stream production is actually realized. The time required to explore for, discover, develop and place production, if any, on stream in such frontier areas will extend into years. Adding to the normal time requirements for exploration and development are current problems in obtaining offshore rigs, platforms and other marine supplies as well as pipe. In fact, the development of new OCS leases in known productive areas, such as in the Gulf of Mexico, could be slowed due to shortage of equipment and supplies.

1/ Ibid.

2/ Ibid.

3/ Data provided in response to Commission letter order dated July 26, 1974.

4/ Ibid.

In addition, the anticipation of supply problems involved in the large lease acreage proposed in the DES may reduce the development incentive of individual least tracts. This could result in lower bids, as well as a rate of development lower than that which would otherwise be anticipated from a large lease sale. We suggest that further discussion be given in the DES to the relationship between the total size of the lease acreage and potential bid revenue, and the availability of equipment necessary for OCS exploration and development activities.

It is also recommended that further investigation be made of alternate bidding systems. Leasing systems which involve a royalty payment or which delay the bonus payment until after production begins appear to be more equitable than the present practice in which the lease purchaser is required to gamble large sums of money on a venture which is often of questionable outcome. The alternate bidding systems would also free money for investment in additional leases as well as exploration and development activities.

The staff is of the opinion that, with continued attention given to measures designed to minimize the adverse environmental impacts of exploration and development activities, the adverse impacts associated with the proposed increase in OCS land made available for leasing would be reduced to an acceptable level while allowing the development of necessary energy supplies.

Frank C Allen

Frank C. Allen
Chief, Bureau of Natural Gas

Federal Power Commission (FPC)

The FPC submitted data related to the declining supply of natural gas in the U.S. and other issues. Chairman Nassikas concluded that on balance, the national interests support proceeding with the proposal. Staff comments are addressed below.

P. 1, para. 2 - These data have been included in the discussion of OCS oil and gas and its future relationship to the energy supply mix.

P. 2, para. 1 - These data have now been included.

P. 2, para. 3 - The various problems addressed in this paragraph have been addressed, primarily in Section VIII on Alternatives.

P. 4, para. 1 - The pre-sale evaluation process operates independently of industry's materials and capital requirements. Evaluation is done by combining data on potentially recoverable reserves with prices discounted to the anticipated year of production. Insufficient bids are rejected, no matter what the economic climate.

Alternative lease bidding systems are discussed in the statement. Royalty bidding has recently been attempted (Louisiana Sale #36) and other systems, such as deferred bonus payment, are being investigated.

ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF THE
ADMINISTRATOR

10 JAN 1975

Mr. Curtis J. Berklund, Director
Bureau of Land Management
U.S. Department of the Interior
Washington, D.C. 20240

Dear Mr. Berklund:

The Environmental Protection Agency has reviewed the draft environmental statement on the Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf. We acknowledge the need to expand domestic energy supplies, and especially OCS oil and gas resources, however, the protection of the environment is of equal concern. The increase in OCS leasing and the means by which the OCS development is managed may be among the most critical energy decisions to be made in this decade, and while offering the possibility of significantly augmenting energy supplies, will likely bring profound social and economic changes to the coastal zone as well as serious long term impacts to the ocean environment.

The evaluation of this proposal in an impact statement should be comprehensive, thorough, and documented if it is to serve as a decision making document and a means of advising the public of the consequences of the action. While we are cognizant of the immensity of the task of examining the programmatic options relative to this proposal, we do not feel the statement succeeded in the analysis. Therefore, in accordance with the EPA rating system for environmental statements, we have classified this statement as Category 3, Inadequate. This statement has described the environmental consequences of OCS operations in general, but has not addressed key policy options and managerial issues pertaining to an accelerated OCS oil and gas leasing program.

Of primary concern is the proposed increased figure of 10 million acres to be leased in 1975. (This, of course, implies a much larger offering than 10 million acres.) The impact statement fails to evaluate or justify the necessity for this size offering, and the need to simultaneously enter Atlantic and Alaskan virgin areas. Nor is any consideration given to data derived from Project Independence studies which seem to clearly refute the expediency of this size offering. There is no objective analysis given to the option of reducing the proposed acreage to be leased, or deferring the offering of various virgin areas. It is, furthermore, unclear what role accelerated OCS leasing will play in the larger context of a national energy policy, especially in relation to predicted oil and gas shortages that may occur in the next few years.

The assumed necessity for such a large sale necessitates immediately offering sizable acreage in all of the frontier areas. The Council on Environmental Quality recommended in their April 1974 Assessment of OCS Oil and Gas Development that great care be taken in the development of frontier areas, and that the location and phasing of OCS leasing be designed to achieve energy supply objectives while minimizing environmental damage. This study documented the need for caution in development and assessed frontier areas in order of environmental risk. Some of these areas, especially the Gulf of Alaska, contain unique and vulnerable natural resources combined with significant natural hazards that would make precipitous development highly undesirable from an environmental standpoint. The accelerated development plan, as presented in the proposed schedule of 10 million acres, takes no cognizance of this assessment and further disregards the recommendations of the CEQ study. We feel that every effort should be made to phase leasing activity in frontier areas so that the most highly vulnerable areas will be protected from possibly irreversible adverse impacts of oil and gas development. This end would be well served by having the statement provide the rationale and environmental factors utilized in the selection of leasing areas. It would also be appropriate to provide the rationale for tract selection within specific areas. Clearly, such a scrutiny of areas could delay the need to prematurely enter environmentally sensitive or hazardous areas. This strategy would also allow more leasing in areas that are better ecologically known, and thereby allow more adequate time for biological baseline studies in frontier areas.

In this connection, we feel the environmental baseline work being done on various OCS areas should be completed and analyzed before development is permitted. It is impossible to adequately evaluate the total environmental scenario of any of the proposed leasing areas at this time, and the prediction of environmental consequences depends upon the compilation and analysis of adequate baseline data. The final statement should detail the environmental studies to develop the baseline on virgin areas. Likewise coastal management planning should be accelerated to prepare for the smooth integration of OCS induced coastal development. States adjacent to existing offshore development activity have incurred significant environmental, economic and social costs, with no mechanism for remuneration other than possible expansion of their own tax base. These direct costs, along with indirect effects of population shifts, employment pattern alteration, increased demand on public services, and changes in land use should be thoroughly considered in advance of any future leasing decisions. This was a concern also expressed by the Senate Committee on Commerce in their study of the Outer Continental Shelf Oil and Gas Development and the Coastal Zone. The statement should adequately address the critical interface of State and Federal planning that must precede OCS and OCS induced development.

Finally, there seems to be substantial doubt as to the ability of the offshore industries to absorb the proposed accelerated schedule from the standpoint of available capital and available equipment. It is most unlikely considering current shortages of drilling rigs, manpower, and tubular goods, that the oil and gas industry could promptly develop all of the tracts leased, if in fact, there is sufficient industry interest and capital to lease 10 million acres. In the face of enormous capital requirements, the increased acreage may only serve to lower the level of competition in the bidding process and thereby lessen the opportunity of the public to achieve a fair market value. Further, discovery could be impeded because of the need to fragment exploratory efforts in leased areas. The attached material will provide further analysis of these issues and will offer for your consideration some related policy options.

We recommend this statement be revised to address the above issues and reflect recent policy developments. The statement should also be coordinated with and include a justification for the anticipated order of lease offerings as depicted in the November 1974 proposed schedule for leasing.

We also recommend that the Department consider the preparation of area EIS's for all virgin areas to facilitate the selection of areas amenable to resource development and to protect other environmentally sensitive areas. Such an EIS could be prepared independently or in conjunction with an EIS for the first lease sale in a virgin area.

We appreciate the opportunity to have reviewed this statement and hope our comments will be of assistance to you. We will be happy to meet with you to discuss any of the issues raised in these comments.

Sincerely yours,

Sheldon Meyers, Director
Office of Federal Activities

Attachment

Specific Comments on Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf

A. Practicability of Leasing Ten Million Acres in 1975.

1. Data from the Project Independence Blueprint (PIB) Task Force on Oil and Gas do not support the necessity for leasing ten million acres in one year under any scenario. Since the PIB Task Force on oil was led by DOI and used DOI data and personnel, there should be consistency between the conclusions reached by PIB, and those by DOI relative to the proposed action. In fact, it appears that the analysis and data in PIB did not in any way affect the policy decision to accelerate leasing. Furthermore, PIB data, both published and unpublished, show clearly that even under the most optimistic scenarios, insurmountable shortages of materials will constrain OCS development until at least 1980, since this is the earliest date by which exploration could be completed in any area. The following projections are based on data from the Oil Task Force and assume accelerated activity and high exploratory efficiency (40% greater than present exploration efficiency).

Area	Acres Leased (Millions)	Year When Exploration is Complete
Gulf of Mexico	3.5	1980
S. California	.9	1980
Atlantic	2.1	1986
Alaska	3.5	after 1988
Total	10.0	

Source: Project Independence Oil Task Force, Computer Run T. II. b.

2. The immediate and most important constraint on exploration will be availability of mobile marine substructures for drilling rigs. Their production and use will pace exploration for the next several years, depending on their luck in finding oil and the efficiency of their use. At present there are 102 mobile substructures available. In addition, if the government allocates materials to construct mobile substructures as quickly as possible and ensures that facilities are not exported, the demand for facilities and the number available will approximate the following:

Demand and Supply for Mobile Structures
(rig years)

Assuming:	1975	1976	1977	1978	1979	1980	1981	1982
low exploratory efficiency								
Demand	3296	3194	3017	2755	2427	1921	1415	798
Supply	102	177	262	328	409	506	617	749
high exploratory efficiency								
Demand	2075	1973	1796	1534	1206	797	291	-
Supply	102	177	262	328	409	506	617	-

Sources: PIB MEC Task Force
PIB Oil and Gas Task Force, T. II. b-h.

3. The maximum amount of land per year that can be explored is:

	Million Acres Explored per Year					
Assuming	1975	1976	1977	1978	1979	1980
1. Low exploratory efficiency and Business as Usual supply of material	0.3	0.4	0.6	0.8	1.0	1.3
2. High exploratory efficiency and Business as Usual supply of material	0.5	0.7	0.9	1.2	1.6	2.0
3. Low exploratory efficiency and accelerated supply of material	0.3	0.5	0.7	1.0	1.2	1.5
4. High exploratory efficiency and accelerated supply of material	0.5	0.8	1.3	1.6	2.0	2.4

Source: PIB Computer Run T. IV. a-e.

Further data and the backup for these tables are available.

In summary, the PIB data clearly refutes the underlying precepts of the programmatic decision to lease OCS lands very rapidly. The justification for rapid leasing assumed that leasing was a constraint on resource exploitation; while PIB indicates that materials are the constraint. Furthermore, it was assumed that rapid leasing could target materials to the first major discoveries. PIB, however, shows that development cannot be substantially accelerated even with the most fortuitous and efficient allocation of materials.

EPA's position is, therefore, that DOI has not only failed to demonstrate that rapid leasing will free constraints, but on the contrary, the PIB data prove that the leasing rate has little bearing on the rate of development.

B. Inclusion of Alaskan OCS Areas in the Leasing Schedule

1. The CEQ Task Force on the OCS, in which DOI participated, states that the petroleum industry would encounter a higher environmental risk in the development of the Gulf of Alaska than in any other area. DOI has not been able to demonstrate that the benefit in oil development outweighs the environmental cost. In fact, DOI's own data, used by PIB, show conclusively that because of material constraints, there is no relative advantage to leasing Alaskan OCS areas at this time despite the magnitude of Alaska's reserves. EPA's position is therefore that leasing in Alaskan waters should not be considered at this time and that substantial technical and biological research is required. Although we expect that as a result of that research, exploration and subsequent production will be feasible at some point in the future, EPA believes that the point cannot be predicted at this time. In our opinion, it is therefore neither necessary nor prudent for Alaskan OCS areas to be placed on the leasing schedule at this time. We think that the future decision should be based on (1) baseline and biological effects research, most of which has not been funded or planned at this time, (2) coastal zone planning, and (3) assessment of operating experiences with advanced technologies which can be tested in other OCS areas.

2. Exploration of the Gulf of Alaska is environmentally separable from resource development. The programmatic EIS should be specific on this option in the case of the Gulf of Alaska because it may well be that the Gulf should be explored to some extent but that development should await the results of biological and technical research, and detailed land use planning.

3. Analysis of PIB data shows that although the estimated reserves in the Gulf of Alaska exceed those remaining in the Gulf of Mexico by a factor of 2.5, productivity of drilling equipment and investment is much lower than in the Gulf of Mexico. Barrels of oil recovered per foot drilled are high in Alaska but because of extensive expected down-time, primarily because of weather, productivity in terms of oil produced per rig year, was estimated to be only 59% of the productivity of the Gulf of Mexico. (Source: PIB Oil and Gas Task Force Computer Runs T. IV. and T. III)

Issue A in this document used PIB data to show that the binding equipment constraint during the next few years would be mobile substructures for exploratory drilling. In view of this constraint, it would be difficult to justify that early exploration of the Gulf of Alaska would be in the nation's best interest.

4. The PIB scenarios concluded that under some assumptions, extensive and/or rapid OCS development would result in a short period of time when there would be more oil produced than necessary to eliminate imports. For example, in 1985, at $11 per barrel prices, with accelerated development of resources and without an energy conservation policy, PIB calculated that: (1) [illegible] nation would not require any imports of crude oil or refined products, (2) that enough oil would be produced to permit exports of 1.5 million barrels per day if there was no mandatory conservation program, (3) that exports would be much higher with conservation, and (4) that Alaska and the West Coast would be producing almost three times as much oil as they consume (7,366,200 bbl of oil per day produced compared to 2,672,300 bbl of oil per day consumed).

Clearly these estimates by PIB show that domestic production responds quite briskly to stimulation by prices at their present level for new oil, unless there are constraints in materials. The point is not that we don't need the oil but that an immoderate acceleration policy will be economically and environmentally costly, and will produce a brief spurt of self-sufficiency followed by another period of dependency. An assessment should be made of price effects and economic dislocations due to this leasing schedule.

5. Under these conditions, DOI must demonstrate why production in the Gulf of Alaska is a wise policy in view of (1) CEQ's determination that production in the Gulf of Alaska is environmentally undesirable, (2) that use of critical materials, primarily mobile substructures, is comparatively inefficient in terms of daily barrels recovered in the Gulf of Alaska compared to the Gulf of Mexico, (3) that production in the Gulf of Alaska is economically more expensive than in the lower 48 OCS areas, and (4) that production by 1985 in the Gulf of Alaska can be surplus to the nation's need and should, at a minimum, be preserved for future years.

6. EPA realizes that Alaskan OCS reserves will and ought to be produced sometime in the future. The key point is that a few years' delay is required by material constraints, and ought to be taken advantage of by DOI. Some baseline inventory studies have been initiated but DOI has no biological effects or technology studies under way. EPA believes that the economic cost of having a lease sale delayed because of inadequate environmental information far outweighs the costs of all pertinent studies.

7. Choices of technologies and operating procedures can substantially improve the viability of Alaskan OCS production. DOI should make an intensive study of technical alternatives which would reduce risks of Alaskan production and plan to test those technologies so that their reliability can be assessed in other less severe areas. Only after advanced technologies and biological studies have proven that the risk is worth the benefit should a sale be held.

C. Research Needs

The program outlined below is aimed at understanding the effects of OCS development with the end result of providing mitigatory measures. These are research needs of a generic sense: they are not site specific.

1) There is some controversy over the persistence of oil in the marine environment. Periodic release of hydrocarbons could have severe consequences; therefore, a high priority research need is to undertake a careful and intensive investigation to resolve this controversy.

2) The toxicity of crude oil is not well understood. Most studies have been conducted in the laboratory. Toxicity studies need to be undertaken which analyze toxicity over a wide range of variation in environmental parameters.

3) Studies need to be undertaken to understand how ecosystems recover from catastrophic damage, and how the new system differs from the original one.

4) Many parameters affect the functional dynamics of natural ecosystems. The interrelationships and interdependence between the open water of an estuary and the associated wetland are complicated and can vary in different parts of the country. Basic research should be undertaken to expand our knowledge of both the physical and biological parameters of estuaries and wetlands and their interrelationship in areas likely to be affected by OCS leasing.

5) Research should be undertaken to determine methods of spoil placement to improve the productivity of marshes and estuarine areas. Work is presently underway by the Corps of Engineers, but their work is only a beginning and needs to be expanded, preferably in cooperation with other Federal agencies.

6) Since most accidents are a result of human error, it might be worth considering psychological studies of personnel who operate OCS rigs, in order to develop recommendations for the improvement of accident prevention training programs.

D. Coastal Zone Planning

1. A major administrative problem has been the absence of consultation and coordination between DOI and the coastal states over the nomination, location, and siting of specific areas for lease. The DOI should encourage and support the early development of effective coastal zone management programs in states likely to be affected by OCS activities. All development of the OCS should be paced to minimize the risks of environmental damage and the disruption of the infrastructure of the impacted coastal areas. Adequate lead times between planning and implementation are essential to appropriately deal with onshore impacts. DOI has not demonstrated consideration of staging development for comprehensive coastal zone planning.

The only major role played by States prior to OCS leasing is to exercise the right to comment on environmental impact statements. This means that the State's participation doesn't begin until after the DOI has decided when, where, and how much OCS acreage will be offered for sale. State officials are deeply concerned that the decision to lease 10 million acres was made without the benefit of public input from those who would be most affected.

2. The present pre-lease procedures do not provide adequate and timely acquisition of the necessary information for comprehensive state and local planning. DOI should accept the responsibility for adequately informing state and local governments as to coastal facilities and services likely to be needed in connection with OCS activities. DOI should provide the coastal states with the following information to ensure responsible and timely planning efforts:

A. Data regarding the location and magnitude of potential offshore oil and gas resources.

B. Data and plans for OCS development, including estimates of the number of types of facilities needed for production, refining and transportation.

C. A projection of types and numbers of municipal facilities which will be required to service the population and industry to be impacted by OCS development.

3. Coastal states should be given a reasonable time to formulate their management programs to accomodate the demands of offshore development. The DOI should delay its leasing for oil development in frontier areas until states have completed and implemented their coastal zone plans. Within two years most of the coastal states will have completed their plans, baseline studies of virgin areas will be completed and the leasing of frontier tracts could proceed with a reduced risk to the environment.

4. Studies have shown that the states have incurred significant environmental, economic and social costs in the development of their offshore resources. While some costs and benefits should be examined on a national basis, coastal states would clearly realize a more equitable share of the benefits if they received additional revenues from the offshore petroleum industry. Federal OCS royalties are an appropriate source for funding aid to coastal states and alleviating onshore impacts. Such a plan, rather than outright grants of fixed proportions of royalties to coastal states, is an appropriate method of dealing with this problem.

The kinds of analysis expected to be undertaken under the Coastal Zone Management Act of 1972 are precisely the kind of analysis which must be made if intelligent decisions are to be reached regarding OCS leasing. Realizing that such analysis will be forthcoming in two years, the burden of proof for immediate leasing in virgin areas must rest on those who would proceed with the present leasing schedule without the benefit of such analysis.

E. Quality and Usefulness of EIS Preparation and Review

As noted earlier, every effort should be made to design the OCS leasing program so that energy supply objectives are met with minimum environmental risk, and so that the most environmentally vulnerable areas will be protected from possible irreversible adverse impacts of oil and gas development. To this end, this programmatic environmental statement should:

1. provide the rationale and environmental factors utilized in the selection of OCS areas to be leased (and in the selection of tracts within areas), and

2. detail the environmental studies to develop baseline information on virgin areas, and the means by which these studies will be used in the decision-making process on area and tract selection.

EPA strongly encourages DOI to consider the preparation of environmental statements for each of the proposed OCS areas to be leased in order to assess the full impacts of oil and gas development within these areas. These statements would include the cumulative primary and secondary impacts of individual lease sales, including onshore impacts, identify those tracts where oil and gas development would have significant detrimental environmental impacts, and identify those tracts of resource potential conducive to safe development. Such statements could be prepared in conjunction with developing a leasing schedule for the area or accompany the first leasing sale in the area.

The present programmatic environmental statement should also assess administrative alternatives to the present EIS preparation system that would improve the usefulness of EIS preparation and review with respect to OCS oil and gas development. At present, tract nomination and selection are determined primarily by industry interest and hydrocarbon potential. It is our view that environmental considerations are not as yet a meaningful part of the area and tract selection processes.

Further, impact statements prepared in connection with lease sales can often do little more than project very general consequences of operating plans. There is little information to predict cumulative impacts, location of pipeline corridors or onshore development. The present system, which ties exploration and development to a single leasing system, with the EIS process generally applied to the lease sale, can lead to the undesirable consequences that exploration is held up while development issues are debated, or the government's commitment to exploration (and subsequent development) proceeds through the leasing system with inadequate consideration of environmental consequences and mitigating alternatives.

We request that consideration be given to the benefits of a dual EIS system and to the separation of exploration and development decision processes (to the extent that this is possible under existing law) in order to facilitate reasoned decision-making about oil and gas development and the means to avoid or mitigate adverse environmental effects. For example, an EIS prepared after tract nomination but before tract selection is finalized would focus on marine biological aspects and accomplish the early examination and screening of tracts that can be safely and profitably developed. To the extent possible within knowledge constraints, this statement would also evaluate development impacts.

Subsequently, EPA, State and public review of development plans and operating orders would be afforded and, if there were environmentally significant developments which had not been analyzed in the previous EIS, a developmental EIS would be submitted (perhaps on a development unit basis). This second review process would allow fuller consideration of pipeline corridors, coastal development, induced development and related environmental effects than is presently possible.

Finally, we believe that legislative alternatives which would facilitate consideration of environmental factors in selecting and developing areas should be addressed in the final statement. Several of these alternatives are listed below:

1. Two Title System: Frontier OCS regions would be divided into large blocks. Companies would bid for exploration permits for one or more blocks. At two-year intervals, the permit holder would be required to forfeit a percentage of the block to government control. The permittee would retain sole production rights to the remaining acreage. Issuance of a production license would be contingent on a public review of the environmental acceptability of the proposed production plan.

2. Exploratory Leases with Preference Rights: Government would sell large areas to consortiums for exploration. Only exploratory lease holders would have the right to bid on developmental leases. Before production rights are granted, there would be a mandatory environmental analysis to determine if, and under what conditions, the leases could be produced.

3. Full Scale Governmental Exploration: The government would contract with private companies to explore the OCS. Oil discoveries would be sold competitively as reserves in the ground, of an environmental analysis determines that energy benefits outweigh environmental costs.

United States
Environmental Protection Agency
Washington, D.C. 20460

FEB 11 1975

The Administrator

Dear Rog:

This is to clarify certain portions of the Environmental Protection Agency's (EPA) comments on January 10, 1975, concerning the Bureau of Land Management's draft environmental impact statement entitled, "Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf." Specifically, I would like to address page 7, paragraph 3 of the detailed comments.

EPA does not recommend a two year delay in leasing tracts in the frontier areas on the Outer Continental Shelf. Our concern is with the development of the tracts after the leases have been let. Unfortunately, the drafting of this section of our comments failed to convey our intended meaning. The correct interpretation of the comments has been transmitted to the Director, Bureau of Land Management (copy enclosed).

If you have any questions concerning our clarification of these comments, please contact me.

Sincerely yours,

Russell E. Train

Honorable Rogers C.B. Morton
Secretary of the Interior
Washington, D.C. 20240

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 7 1975

OFFICE OF THE
ADMINISTRATOR

Mr. Curtis J. Berklund, Director
Bureau of Land Management
U.S. Department of the Interior
Washington, D.C. 20240

Dear Mr. Berklund:

This is to clarify certain portions of the Environmental Protection Agency's (EPA) comments on January 10, 1975, concerning the Bureau of Land Management's draft environmental impact statement entitled, "Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf." Specifically, we would like to address page 7, paragraph 3 of the detailed comments.

EPA does not recommend a two year delay in leasing tracts in the frontier areas on the Outer Continental Shelf. Our concern is with the development of the tracts after the leases have been let. Unfortunately, the drafting of this section of our comments failed to convey our intended meaning. The correct interpretation of the paragraph should be as follows:

3. Since eventual development of the subject leases may result in adverse secondary environmental impacts from the onshore facilities and their attendant support complexes, it is important to have the thinking of the affected states incorporated into the DOI plans. Therefore, coastal states should be given a reasonable time to formulate their management programs to accommodate the demands of offshore development. The DOI should consider delaying its approval of oil development plans in frontier areas until states have completed and implemented their coastal zone plans. Within two years most of the coastal states will have completed their plans, baseline studies of virgin areas will be completed and the development of frontier tracts could proceed with a reduced risk to the environment.

EPA's recommendation, which has been discussed with members of your staff, is that Interior should increase its efforts to coordinate the Federal review of oil and gas development plans with the states which this development will affect. The states' coastal zone management plans are a particularly relevant mechanism for assessing the impacts in coastal waters and immediate onshore areas of oil and gas development. The Interior Department can be of real assistance to the states in terms of providing data developed through its environmental and resource review processes on the location and extent of offshore resources and probable location and extent of onshore facilities to develop those resources.

We understand that plans in some states are in advanced stages of development. With the cooperation and help of the affected Federal agencies (including the Interior Department and ourselves), all coastal states should have their plans implemented in time to be of assistance in reviewing offshore oil and gas development and its related onshore impacts.

If you have any questions concerning these comments, please contact me.

Sincerely yours,

Sheldon Meyers

Sheldon Meyers
Director
Office of Federal Activities

Environmental Protection Agency (EPA)

The EPA offered numerous substantive comments centered around the following issues: 1) practicability of leasing 10 million acres in 1975; 2) inclusion of Alaskan OCS in leasing schedule; 3) research needs; 4) need for coastal zone planning; and 5) the quality and usefulness of EIS preparation and review. The EPA comments consist of a cover letter discussing general topics, specific comments, and a subsequent letter explaining one of the specific comments. Regions IX and X submitted comments that were incorporated into the agency comments.

General

Page 1, para. 2 - The final EIS considerably expands discussions of key policy options and managerial issues related to an expanded OCS leasing program. In addition, a policy option document is being prepared within the Department that will be distributed for public comments. The document will contain many of the non-environmental issues that must be considered in the overall balancing of environmental costs and economic benefits that will go into the decision-making on this program.

Page 2, para. 1 - It was not the purpose of the draft environmental impact statement to justify or evaluate the necessity of an accelerated leasing program, only to identify quantitatively and qualitatively the environmental and socio-economic impacts that will result from such a program, as well as alternatives to the program.

In the interests of flexibility in decisionmaking, the impacts associated with potential leasing in all OCS areas were discussed. The Project Independence Blueprint had not yet been released when the draft EIS was made available in October 1974. A proposed planning schedule of lease sales was released by DOI in November 1974; this provides the framework for discussion of implementation and alternative scheduling of vulnerable areas. The role of OCS leasing in terms of a national energy plan is discussed in Section VIII on Alternatives.

Page 2, para. 2 - The recommendations of the CEQ report were not specifically addressed in the draft EIS, but familiarity and cognizance of the document were reflected in numerous instances. A separate discussion of the CEQ report has been included in this final EIS, as well as the rationale for tract selection within specific areas. The rationale of lease area selection is the primary focus of this entire statement.

Page 3, para. 1 - Much of the environmental baseline work in different OCS regions will have been completed before development proceeds. However, it must be pointed out that baseline studies are not specifically designed for prediction of developmental impacts; they are designed to construct a base case against which developmental impacts can be measured. To this end, baseline studies are but the first phase of data collection that will continue for several years. To some extent, baseline studies will augment existing literature resources as background information to be used in the preparation of site-specific impact statements. While some predictive capability will be derived from baseline studies, e.g. oil spill trajectory models, they will primarily identify unique environments and localized areas that may be hazardous to operations. Socio-economic studies will also be conducted. Coordination between States and the Federal Government is more completely addressed in this final EIS.

Page 3, para. 2 - The final EIS examines the argument of constraints of manpower, materials, and capital and finds its somewhat deficient. There is an intrinsic "lag time" in a capital and material intensive industry such as offshore drilling that is predicted on the fact that the extra manpower, materials, and capital will not be sought until there are clear assurances that certain amounts of acreage will be offered and certain development rights will be permitted by the leasing system. However, some industry sources have indicated concern over the availability of trained manpower and an accelerated program. On the other hand, the Government's system for evaluating the worth of individual tracts operates independently from industry's capital generating capability. Rigid standards are imposed for minimal bid requirements, which are established by estimating the oil and/or gas in place and affixing a value based on current market prices. These standards for minimum bids insure that fair market value is obtained in lease sales.

Page 4, para. 1 - Individual site-specific impact statements will be prepared for any lease sale proposed, as a matter of Departmental policy. The possible future development of that region will also be discussed.

Specific Comments

A-1. The Project Independence Blueprint (PIB) had not yet been released when the draft EIS was published, and thus could not contribute to the promulgation or analysis of an accelerated leasing proposal. The PIB is discussed in several different sections of the final EIS. However, the PIB information presented here may be interpreted in other ways. First, the long lead time for complete exploration in frontier areas and the recognized need to know the extent of these resources argue for near-term leasing of acreage in many areas of the OCS. At the present time, exploration can only be accomplished by leasing the lands under the legislative framework of the OCS Lands Act. Secondly, the dates used are for the completion of exploration, and do not reflect the fact that significant finds could be made early in the exploratory program and new production might already have begun by the time exploration is complete.

A-2. In response to the data presented from the Project Independence Blueprint, the following quotation is presented.

> "In the absence of an accleration of capacity expansion beyond expansion rates currently planned by industry, shortages of fixed and mobile platform would emerge, and would constrain the exploration and production of oil and gas in the U.S." (PIB, p. 240)

The guarantee or significant assurance that sufficient acreage will be leased is the only basis on which industry will accelerate capacity expansion beyond current rates. The limits of capacity expansion have never been investigated, to our knowledge; we suggest that such limits are high when financial incentive is high.

B-1. The analysis of relative environmental risks associated with development in all OCS regions presented in this final EIS concurs with, and goes beyond, the CEQ report. Our analysis of all OCS areas (not just the Atlantic coast and Gulf of Alaska) indicates that development in Alaskan waters entails at least a moderately high environmental risk. The Gulf of Alaska is a high risk area. The various aspects of this determination, as well as discussion of CEQ recommendations, are found in Section III on Impacts.

B-2. This option has been included in Section VIII on Alternatives.

B-3. This information has been incorporated into the sections related to hydrocarbon potential and producibility, and is also reflected in the USGS data on resource potential.

B-4. The PIB scenarios of energy supply and production possibilities are based on National Petroleum Council (NPC) estimates of oil-in-place resources as of 1973. Of the various estimates made on undiscovered resources (NPC, USGS, Huggett, *et al.*), the NPC estimates are at the high end, and coincide with the low end of the USGS range of potential. For the purposes of updating and for this final EIS, the USGS has produced revised estimates of undiscovered recoverable resources. There estimates are found in Section I of this statement, and fall approximately in the range recently estimated by the National Academy of Sciences (*Mineral Resources in the Marine Environment*). Both these recent estimates are significantly lower than previous estimates, and their concurrence argues for revised thinking about the possibility of replacing imports by 1985, let alone producing a surplus. If independence from insecure imports remains a goal, meeting that goal through a National effort entails serious consideration of production from the Gulf of Alaska.

B-5. (1) We concur with the CEQ determination of the high hazard potential associated with development in the Gulf of Alaska (Section III on Impacts). (2) Most, if not all, frontier area development will be inefficient in terms of the comparatively intense development in the Gulf of Mexico. (3) Production in the Gulf of Alaska *will* be economically more expensive than in the lower 48. (4) See B-4 above.

B-6. Biological effects studies are component parts of the DOI environmental studies program. While this specific aspect of the studies program has not yet begun, timing and location of these studies will be determined by the funding levels and progress of baseline and monitoring studies at the time.

B-7. This path of action is discussed in Section VIII as the "lease-to-learn" scenario.

C-1. There is considerable controversy over the persistence of oil in the marine environment. Many scientists feel that the chronic, low-level release of hydrocarbon during operations is possibly the most significant hazard of development. The Department recognizes this as a high priority research need. At the present time, baseline assessment studies are utilizing most of the available funds, but special studies such as oil persistence will be investigated.

C-2. Similarly, toxicity studies will be conducted when funding requirements for the necessary baseline assessment studies are satisfied.

C-3. While this comment states a laudatory goal, it appears a bit too facile. Science is only now beginning to learn how to sample and analyze data that will allow description of an ecosystem (cf.

NOAA's MESA program in the New York Bight) and its dynamic nature. While the environmental studies program will not include a research-oriented catastrophic event, one may occur during operations. Baseline and monitoring information would then be available which would indicate the manifestations of the event in the ecosystem, i.e., population fluctuations and increased hydrocarbon loading of organisms and sediments.

C-4. Nearshore studies are being conducted in the Gulf of Alaska, and are currently being investigated in other areas as a possible integral part of a baseline study or as a part of a pipeline corridor study.

C-5. We appreciate the EPA reminding us of spoil placement studies being conducted by the Corps of Engineers; we will continue to appraise that activity (as should State Governments) for possible participation by DOI.

B-6. We do not have information that would confirm that accidents caused by human error on offshore structures are due to psychological problems. Our data ("Accidents Connected with Federal Oil and Gas Operations on the Outer Continental Shelf", January 1975, compiled by the USGS) indicate that certain types of activities are more hazardous then others (e.g., wireline work on wells and welding operations) but there is no reason to assume that the cause of these accidents is related to the psychological state of the personnel working on the rigs. We do known that every employee on an offshore rig or platform has had a physical examination. Moreover, almost all have at one time or another participated in training programs that increase their level of responsibility. Also, these men work in a restricted area, they work with the same people every working day, and team work is essential, and they are closely supervised. Under these circumstances anyone exhibiting psychological problems would be very noticable. Also, some human error accidents are caused by ships colliding with platforms or barges with dragging anchors which can sever pipelines. Not all accidents that can be attributed to human error are caused by personnel on offshore drilling rigs or platforms.

D-1. The Department has made a commitment to greater consultation and coordination with State Governments than has been exhibited in the past. Several Governors' conferences have been held to mutually advance positions and discuss pacing of OCS development. Recently, the Department suggested that a policy advisory board be created for the OCS program and be composed of State and Federal representatives. This is an outgrowth of the research advisory board that currently advises the Department on OCS-related research activities. Policy issues could not be adequately handled by a technically and scientifically oriented advisory board. The possibility of a policy board for Federal and State agencies was first presented by the Department on April 18, 1975, at a research advisory board meeting.

D-2. The information transmittal suggested by EPA is reasonable, and, to the extent possible, has been accomplished in the final EIS.

D-3. See subsequent response to the letter from Russel Train, Administrator of EPA.

D-4. Various options concerning sharing revenues from OCS development with coastal and non-coastal States were presented to the President by the Secretary of the Interior. These options are being reviewed and decisions should be forthcoming.

E. The rationale and environmental factors utilized in selection of OCS leasing areas and tracts within areas are discussed in this statement. The completed, on-going and future study plans are also detailed. As noted earlier, the environmental studies are designed to identify the effects of OCS operations, and in most cases will only be marginally useful in tract selection (oil spill trajectories, unique areas, hazards). They will play little if any role in area selection.

The Department will prepare individual site-specific impact statements on any and all lease sale proposals, in accord with NEPA requirements.

The most beneficial administrative alternatives to the present EIS preparation system would be increased involvement of Federal and State agencies at the earliest possible point in the pre-sale process. It is difficult to bring the EIS to bear at the call for nominations or tract selection stage, as these actions are used to arrive at a specific proposal, and in and of themselves, do not affect the environment. The system used consists of summary resource reports being prepared by Fish and Wildlife Service and NOAA before tract selection, and EIS preparation after tract selection that focuses on each individual tract included in the offering. Each site-specific EIS prepared for a proposed OCS sale contains a description of the tract selection process, including environmental factors, which are utilized in determining the proposed sale area. See especially pp. 9-14, V. I., Draft EIS for a Proposed OCS Lease Sale Offshore Southern California. Relative environmental risks are evaluated, and recommendations on inclusions or exclusion of each tract are offered. Strategies for area selection have been included in this final EIS based on leasing first for high hydrocarbon potential, leasing last the environmentally hazardous areas, and leasing to learn.

While the separation of exploration from development may not be possible under the OCS Lands Act, several measures have been introduced in Congress that will directly or effectively amend the Act to achieve this separation. The Department is currently investigating what modifications can be made under existing law including a dual EIS system to separate exploration and development phases. It has been suggested, and indeed is permissible under law, for the USGS to require the preparation of an EIS on any or all development plans submitted by industry after leasing.

The three legislative alternatives suggested by EPA all center upon the critical questions... Should exploration be separated from development, and by what mechanism? The EPA suggestions cover the range of exploration only to exploration tied with strong development rights. However, the mechanism of separation is relatively unimportant from an environmental standpoint. This final EIS addresses the concept of segregation of exploration and development in detail in Section VIII on Alternatives.

ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, D. C. 20301

HEALTH AND
ENVIRONMENT

17 MAR 1975

Mr. Curt Berklund
Department of the Interior
Bureau of Land Management
Washington, D.C. 20240

Dear Mr. Berklund:

This is in response to your request for our review and comments on the draft environmental impact statement on the proposal to increase the outer continental shelf (OCS) oil and gas leasing to ten million acres in 1975.

The Department of Defense (DoD) must be brought into the coordination cycle during the earliest phases of initial planning concerning specific areas under consideration for leasing. Only in that way can a realistic and timely effort be made to accommodate any proposed offshore operations which might conflict with Defense activities.

Our specific comment on this draft statement is contained in enclosure 1. We appreciate the opportunity to review this statement.

Sincerely,

George Marienthal

George Marienthal
Deputy Assistant Secretary of Defense
for Environmental Quality

Enclosure

Enclosure

We recommend that Section G Impact on Military Use of the OCS, Page 283, Volume II of subject DEIS be rewritten as follows:

> "The U.S. OCS and continental slopes are used rather extensively by the Navy and Air Force for weapon systems research, development, test and evaluation and training operations. Included are such activities as missile and ordnance firings, drone launch and recovery operations, and torpedo firings. Most activities take place in sea and overlying airspace designated for these purposes. Undesignated classified operations take place in some areas. Rather than requiring blanket restrictions on the development of certain OCS areas for purposes of oil and gas exploitation, the Department of Defense reviews the tracts nominated by industry in coordination with the Department of the Interior and recommends to that Department the exclusion from the lease sale of those tracts essential to National security."

Department of Defense (DOD)

The Department of Defense requested that the submitted language on Impact on Military Uses of the OCS be included in the Final EIS. This has been done. In all cases, coordination with DOD is sought at the earliest stages of planning, specifically during tract selection.

DEPARTMENT OF DEFENSE
UNITED STATES OF AMERICA

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:

NEDPL-R

16 January 1975

Director
Bureau of Land Management
Department of the Interior
Washington, D. C. 20240

Dear Sir:

This letter constitutes our review of your Draft Environmental Statement (DES 74-90) on the "Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf."

Our primary responsibility and concern lies in the Atlantic Region and more specifically, the North Atlantic. With this in mind, the absence of pages 252 to 269 of Volume I precludes our completing a comprehensive review at this time. Further, we feel that vital to our review is a complete copy of the OCS Environmental Studies Program.

In view of future site specific Draft and Final Environmental Impact Statements, we will reserve a detailed comment until such time as they appear. We would recommend that they include an outline and discussion of proposed pre- and post- operational monitoring of the marine environment. A discussion with respect to permits and national security as they apply to OCS structures is vital to a complete statement. These could very well be included in the site specific statements but due to the broad scope of this programmatic draft they should be included.

Sincerely yours,

CHARLES J. OSTERNDORF
Colonel, Corps of Engineers
Acting Division Engineer

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, D.C. 20314

REPLY TO
ATTENTION OF:

DAEN-CWP-V

31 January 1975

Mr. Curt Berklund
Director
Bureau of Land Management
U.S. Department of the Interior
Washington, D.C. 20240

Dear Mr. Berklund:

The draft environmental impact statement for Oil and Gas Leasing on the Outer Continental Shelf has been reviewed. Our comments are inclosed.

We appreciate the opportunity to review this statement.

Sincerely yours,

Marvin W. Rees

MARVIN W. REES
Colonel, Corps of Engineers
Executive Director of Civil Works

1 Incl
As stated

DAEN-CWP-V 31 January 1973

Mr. Curt Berklund
Director
Bureau of Land Management
U.S. Department of the Interior
Washington, D.C. 20240

Dear Mr. Berklund:

The draft environmental impact statement for Oil and Gas Leasing on the Outer Continental Shelf has been reviewed. Our comments are inclosed.

We appreciate the opportunity to review this statement.

Sincerely yours,

1 Incl
As stated

MARVIN W. REES
Colonel, Corps of Engineers
Executive Director of Civil Works

CORPS OF ENGINEERS COMMENTS ON DRAFT EIS FOR OIL AND GAS LEASING ON THE OUTER CONTINENTAL SHELF

VOLUME I

1. Page 6, second paragraph, second sentence. It is believed that there is Outer Continental Shelf production at the present time, although limited in extent on certain locations off Louisiana and in other Gulf areas.

2. Page 65, sixth line. If sacrificial anodes are to be used, how long will they last and when will they be replaced?

3. Page 88, eighth line. The Corps of Engineers should be included on list of specific coordinating Federal agencies.

4. Page 113, last paragraph. The words "should" and "could" relative to availability of clean-up material should be changed to "must."

5. Page 109, paragraph e. In the discussions on contingency plans, it should be noted that onshore and offshore facilities are required to have a Spill Prevention Control and Countermeasure Plan (paragraph 112.3(a) and (c) Federal Register dated 11 December 1973).

6. Page 115a, paragraph (3). The authority of the Secretary of the Army, which is delegated to the Corps of Engineers,"....to prevent obstruction to navigation in the navigable waters of the United States is hereby extended to artificial islands and fixed structures located on the Outer Continental Shelf," is derived from Section 4(f) of the OCS Lands Act. In general, since the Coast Guard regulates above water structures, Corps responsibility has been taken as permitting of artificial islands, structures, and pipelines. The burial depth of pipelines crossing shipping fairways is generally at least 10 feet. Permit applications involving artificial islands and fixed structures constructed on lands which are under mineral lease from the Bureau of Land Management, Department of the Interior, are evaluated on the basis of the impact of the proposed work on navigation and national security.

7. Page 119, paragraph 3a, last sentence. At the present time, most coastal states have no planning funds available. This is an involvement of merely updating the statement.

8. Page 147, paragraph 2, lines nine and through twelve. Although it is recognized that the power-weight ratio of automobiles has brought about more inefficient performance, and the power appliances attached thereto have increased fuel consumption, the effect of antipollution devices on the later models of automobiles, including compact models has brought about increased fuel consumption by as much as 30% per unit. This would appear large enough to warrant consideration in the statement at this point.

9. Page 160, paragraph (ii). Recent announcements by the Canadian government (22 November 1974) state their natural gas and petroleum exports to the United States are going to be reduced or perhaps stopped altogether. Should be updated.

10. Page 161. Statement should mention energy cost required to liquefy natural gas (est. of natural gas used in liquefication process).

11. Page 166(5), Oil and Gas Reserves. The first paragraph is contrary to the second sentence, page 1, which implies an almost certainty relative to hydro-carbon availability on the O. C. S.

12. Page 240, paragraph 1, last sentence. Last sentence should be rewritten and placed in context.

13. Page 471, last paragraph. Silt and clay may predominate but other sediments are also found in quantity.

14. Page 474(c), paragraph 2. Geologic Hazards should be expanded to list number and locations of oil and gas wells subjected to 1964 earthquake stresses.

15. Page 505, paragraph 1. Change typographical error "Cooper" to "Copper."

16. Page 537. Table 25 should be updated in light of more recent data.

17. Page 537. Cyclical nature of some fisheries due both to biology and economic conditions should be discussed.

18. Page 546. Typographical error requires correction in second to last sentence of paragraph 2.

19. Page 547, last paragraph. It is doubtful that Dell's porpoises would be found in salmon nets.

20. Page 656, second sentence. Clarify "the Federal Project," by adding "for Corps of Engineers maintenance dredging."

21. Page 740, Federal Wildlife Refuge. The Aransas National Wildlife Refuge should be identified in the discussion. This refuge is an important link in the chain of waterfowl (whooping crane) areas along the Gulf Coast.

22. Page 744, last paragraph. In the first line, a term is apparently missing between "2.3" and "saltwater anglers."

23. Page 763, paragraph (6). Insert "See 33 CFR, Chapter II, paragraph 402 for Corps of Engineers dredging zone regulations."

VOLUME II.

1. Page 2, paragraph 3. "Dominant" in relation to deer requires clarification; i.e., is the dominance in number, size, or area or is this mammal at the top of the food chain?

2. Page 4, paragraph 1. "Coho" should be used instead of "silver."

3. Page 16. Impact of recent judicial decision giving Indians exclusive fishery right should be discussed here.

4. Page 17. Discussion of the extent and value of recreational fishing is also needed for balance in comparison with the commercial fishery.

5. Pages 55-59. These pages duplicate previous pages 13-17 in this volume.

6. Page 109. Criteria for offshore dredging disposal sites should be discussed.

7. Page 112. Typographical error "toxonomic" should read "taxonomic."

8. Page 121, paragraph 4. Land use also involves considerable commercial hunting, fishing, and trapping.

9. Page 135, paragraph 2. Potential for future development is also a deterrent to lack of road systems.

10. Pages 146-147. Clarity of graphs requires improvement.

11. Pages 212-214. This entire discussion appears to ignore or lightly pass off the impacts of pipeline installations through the beach-dune system. Improper installation techniques would destroy the entire beach system unless protective methods were used through the dunes and hummocks. Dune protection is one of the major problems relative to beach erosion control. Over a short period of time, the damage done by an oil-spill on the beach is far less severe than the elimination of the dunes and the total beach protection they afford.

12. Page 214(2), paragraph 3. If done properly, the presence of a pipeline would be undetectable upon completion of pipeline installation through the dune-line. This would involve back-filling, grading to the natural contours and replanting, but it should be a required procedure.

13. Page 255, paragraph 1, last sentence. This statement contradicts the statement on page 214(2). Aesthetic and Scenic Values, paragraph 3.

14. Page 157(III A), first sentence. It is a proven fact that not all oil spills, as implied, constitute the most severe impact on the environment. Conditions and situations in Louisiana would indicate that some oil spills have little effect on the environment.

15. Pages 159-160. These statements imply that habitat removal, drainage and circulation modifications are necessarily inherent to on-shore development. This is not the case or the situation. Appropriate planning and considerate operations have shown a number of times that such development can be done with little or no serious environmental degradation in the northern Gulf of Mexico.

16. Page 186, paragraph b, first sentence. It has been shown in a number of instances that while benthic marine organisms do not suffer from the direct effects of an oil spill, the precipitants and submergents used for clean-up activities have created a severe problem in this respect. (Smith, J. E., 1968 Torrey Canyon - Pollution and Marine Life (N. Y., Cambridge University Press).

17. Page 289. Need reference to DA permit.

18. Page 374. The listing shown for sites and installed capacity for Washington and Montana is questioned. The installed capacity for A (addition to existing plants) category for the State of Washington appears to be low. Installed capacity for four Corps projects and one PUD project is approximately 2770 MW. The listing for the State of Montana does not include the installed capacity of 840 MW for Libby Project.

19. Page 375. The Oregon listing for possible development by 1993 is low. It appears that projects such as 2nd Powerhouse at McNary and additional units at John Day were not considered.

20. Page 379, paragraph 2, first sentence. This statement is misleading. The implication is that the recreational potential is reduced or only slightly affected. The contrary is true. Recreational use of hydro-electrical installations has at least doubled in each and every case.

21. Page 379, last paragraph. Nitrogen narcosis in fish is a local phenomena and specifically in the northwest. This statement implies that it occurs on every impoundment and this is not the situation or the condition.

22. Lease agreements. Lease agreements should insure that drilling platforms and related structures will not be allowed to interfere with vessel traffic using established navigation fairways. In this connection, action has been initiated by Nueces County Navigation District, Corpus Christi, Texas, to revise the fairway entrance to the Corpus Christi Ship Channel at Port Aransas, Texas. Studies to consider enlargement of this entrance channel to accommodate very large crude carriers with drafts up to about 75 feet are in progress by the Corps of Engineers. The studies have not advanced to where the probable results can be predicted.

Department of the Army - Corps of Engineers

Two sets of comments were received from the Corps of Engineers. The first, from the New England Division, essentially stated that they would await a site-specific EIS on the North Atlantic for intensive review. They indicated that such an EIS should contain an outline of pre and post operational monitoring of the environment. A discussion of permits and national security should be included in the programmatic EIS. The second set of comments came from the Washington Office of the Chief of Engineers. These are discussed below.

Disposition

Volume 1

Page 6 - There is also production from the California OCS.

Page 65- Sacrificial anodes are redundant control systems that are intended to last the life of the pipeline.

Pages 88, 109, 113, 115a - Editorial changes made.

Page 119 - This is incorrect; many coastal states have received planning funds. Maine and Washington have already submitted their initial plans (as impact statements) to the Department of Commerce.

Pages 147, 160, 161, 166, 240, 271, 474, 505, 537, 546, 547, 656, 740 - Editorial

Page 744 - The word missing is "million".

Page 763 - Editorial

Volume 2

Page 2 - Dominance is in terms of size, area, and near top of chain.

Page 4, 16, 17, 55 -59, 109, 112, 121, 135, 146-147 - Editorial

Pages 212-214 - The final EIS takes more cognizance of beach system destruction, in Section I.C. on Operations, and Section III.G. on Generic Impacts.

Page 214 - It is agreed that this should probably be a required procedure, but the BLM does not have the authority to make it a requirement.

Page 255 - Should read "beach assumes its normal appearance generally within a year."

Page 157 - This entire section has been revised, and impacts other than oil spills have been put in better perspective. However, it is felt that the combination of oil spills and chronic discharges from normal operations is probably the most severe impact on biota generally.

Pages 159-160 - It is agreed that, in many cases, these operations have been conducted in an environmentally responsible manner. The opposite is also true, in many cases.

Page 186 - Surfactants and emulsifiers are generally considered extremely noxious to benthos and the cause of some deaths. Their use is strictly limited by EPA in combatting oil spills, except in extreme emergencies, and only with EPA and USGS Supervisor approval.

Pages 289, 374, 375, 379 - Editorial changes made.

The concluding paragraph has been included in Section I.D. on Other Management and Supervisory Aspects of the Program.

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-WS/73)
400 SEVENTH STREET SW.
WASHINGTON, D.C. 20590
PHONE: (202) 426-2262

30 DEC 1974

Mr. Curt Berklund
Director, Bureau of Land
Management
Department of the Interior
Washington, D. C. 20240

Dear Mr. Berklund:

This is in response to your letter of 25 October 1974 addressed to the Coast Guard Deputy Chief of the Office of Marine Environment and Systems with regard to a draft environmental impact statement concerning the proposal to increase Outer Continental Shelf oil and gas leasing to ten million acres in 1975.

The concerned operating administrations and staff of the Department of Transportation have reviewed the material submitted. The Coast Guard had the following comments to offer:

"When the draft environmental impact statement for the site-specific location is circulated for comment, the Coast Guard will be interested in making comments regarding navigational aids, life saving measures, and environmental protection features that are pertinent to each location."

The Department of Transportation has no other comments to offer nor do we have any objection to the generalized draft environmental impact statement. We do, however, expect to have comments to offer on the site-specific draft environmental impact statement.

The opportunity to review this draft statement is appreciated.

Sincerely,

R. I. PRICE
Rear Admiral, U. S. Coast Guard
Chief, Office of Marine Environment
and Systems

U.S. Coast Guard (USGG)

The USCG expressed its interest in reviewing and commenting on the site-specific impact statements, whenever they are published. The USCG is on the list of Federal agencies which are formally requested to review site-specific impact statements.

UNITED STATES
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
WASHINGTON, D.C. 20545

MAR 7 1975

Mr. Curt Berklund
Director
United States Department of the Interior
Bureau of Land Management
Washington, D. C. 20240

Dear Mr. Berklund:

This is in response to your letter to the U.S. Atomic Energy Commission (AEC), dated October 25, 1975 transmitting for review and comment copies of the Department of Interior's Draft Environmental Statement, INT-DES-74-90, entitled, "Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf" which was prepared by the Bureau of Land Management to support an administrative action to increase the lease acreage for OCS oil and gas exploration and development to ten million acres in 1975.

Since the receipt of your letter inviting the AEC to review and comment on the above Draft Statement, the Commission has been abolished by implementation of the Energy Reorganization Act of 1974 and its functions transferred to the Nuclear Regulatory Commission (NRC) and the U.S. Energy Research and Development Administration (ERDA). Those functions formerly under the jurisdiction of the AEC Director of Regulation were transferred to the NRC while those formerly under the control of the AEC General Manager have been assumed by ERDA. NRC has determined that none of their projects will be affected by the action.

We have restricted ERDA comments only to those parts of the Statement that examine reliance on nuclear power as an alternative to proceeding with additional exploration and development of oil and gas sources on the Outer Continental Shelf.

The Draft refers the reader to a more complete discussion of each energy alternative which can be found in the Department of the Interior's publication, "Energy Alternatives and their Related Environmental Impacts (December 1973)." On January 9, 1975, Dr. Liverman sent you

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

the AEC comments on a draft of an updated version of that publication. Since the treatment of the environmental effects of nuclear power is somewhat superficial and much of the discussion on nuclear power in this Draft is similar to the discussion in the Energy Alternatives publication, we request that you consider our previously submitted comments in the preparation of the Final Environmental Impact Statement.

We would like to further suggest that you refer to Section 6 (Volume III) of the Proposed Final Environmental Statement, WASH-1535, Liquid Metal Fast Breeder Reactor Program (December 1974), which we feel provides a fuller assessment of the potential of each alternative technology than the somewhat less detailed treatment provided in this Draft. A copy of this volume is enclosed.

In the discussion relating to the projections of nuclear power, a statement should be added that reflects the effects of recent cutbacks in utility construction plans due to financial problems and reduced energy usage. Also, the statement that fast breeder reactors are expected to be in commercial use in about 1988 (Volume II, page 358) should be changed. The current anticipated date is early in the 1990's.

Thank you for the opportunity to review this Draft Statement. Future Draft Statements for review and comment should be sent to both the NRC and ERDA. ERDA will require eight (8) copies for the review process. These eight copies should be sent to the Office of the Assistant Administrator for Environment and Safety, U.S. Energy Research and Development Administration, Washington, D. C. 20545.

Sincerely,

W. H. Pennington
Assessments and Coordination
Officer
Division of Biomedical and
Environmental Research

Enclosure:
Volume III of WASH-1535

cc: Council on Environmental Quality (5)

Energy Research and Development Administration (ERDA)

The ERDA commented on those portions of the draft EIS which pertained to the viability and technical capabilities of nuclear power as an energy source. Energy alternatives in the final EIS are discussed using the older DOI material, as well as new information taken from Hittman and from the draft of the University of Oklahoma study on energy alternatives, being prepared under contract with DOI. The suggested changes have been made.

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Science and Technology
Washington, D.C. 20230

March 4, 1975

Mr. Curt Berklund
Director
Bureau of Land Management
Department of the Interior
Division of Minerals Environmental
Assessment (730)
Washington, D. C. 20240

Dear Mr. Berklund:

The draft environmental impact statement for Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf - USDI DES 74-90, which accompanied your letter of October 25, 1974, has been received by the Department of Commerce for review and comment.

The statement has been reviewed and the following comments are offered for your consideration.

1. General

It may be erroneous in some cases to apply the techniques and principles used in the development of oil and gas resources of the Gulf of Mexico to the new frontier areas of the OCS. The gradual and incremental development in the relatively peaceful Gulf of Mexico region may bear little resemblance to the proposed rapid development of the frontier areas which have more violent sea and weather conditions.

2. Pipeline, page 60, Volume I

The statement: "For production beyond platform depth range (1,200 feet), drilling must take place from floating drilling vessels and production accomplished using underwater wellheads on the ocean floor." appears to be out of context with the discussion on pipelines.

3. Pipeline Cover, page 63, Volume I

With the potential introduction of Very Large Crude Carriers and Ultra Large Crude Carriers into the lease area, the 3 to 10 foot cover for pipelines may be insufficient protection. It is suggested that the burial requirements be examined for possible hazards in areas to be frequented by such deep draft ships.

4. Pipeline Block Valves, pages 67 and 68, Volume I.

It would be useful to note the size or capacity of pipeline segments isolated by block valves, e.g. in barrels of oil.

5. Oil Spill Containment and Cleanup, pages 78-79, Volume I

A substantial amount of research and development is being conducted by the Coast Guard and industry on the containment and cleanup of oil spills at sea. A discussion of the new generation of equipment being developed should be made.

6. Tankers and Barges, pages 54-58 and 85, Volume I

The transportation methods available for oil, i.e. pipelines and tank vessels, are dictated by several factors which include distance from shore, water depth, sea floor geology, weather, production rates, field size, etc. The use of tank vessels should not be lightly dismissed as a viable long term transportation mode for special areas, e.g. those with a high incidence of seismic activity.

7. National Oil and Hazardous Substances Pollution Contingency Plan, page 110, Volume I

The National Contingency Plan was originally required by the Federal Water Pollution Control Act (FWPCA) Amendments of 1970 (Water Quality Improvement Act) and was initially published on August 20, 1971. Pursuant to section 311(c)(2) of the 1972 FWPCA Amendments the National Contingency Plan was significantly revised in 1973. It is suggested that this information be included in the discussion.

8. Effects of Storms, etc., pages 214-215, 232-235, 308-313, 424-425, and 510-513, Volume I

Due to the serious real and potential hazards associated with severe storms and swells, the efforts of industry to improve the offshore platforms to better withstand the forces of wind, sea and swell could be outlined somewhere in the statement.

9. Phytoplankton, page 431, Volume I

Trace nutrients, such as phosphorus, nitrogen, and sulfur, are also required for phytoplankton metabolic activity. Some mention might also be made of the importance of the phytoplankton community to the world's oxygen supply.

10. Natural Phenomena, pages 556-557, Volume I

It is suggested that this cursory discussion be expanded since it is difficult to comprehend the full impact of these phenomena when coupled with OCS operations.

11. Silt, page 578, Volume I

High silt loads which require dredging are often associated with agricultural activities.

12. Chesapeake Bay, page 606, Volume I

The statement: "The Bay is about 200 miles long; its width varies from 4 to 35 miles of shoreline, two thirds of which is in the State of Maryland." appears to contain a typing omission with regard to length of shoreline.

13. Ports and Shipping, Volumes I and II

The impact of OCS development on ports and on waterborne transportation will be substantial. Expansion of these sections is recommended. The Maritime Administration is willing to assist the Department of Interior in this area.

14. Imports/Exports, page 46, Volume II

Tonnages should read "thousands of short tons".

15. Effects of Oil, page 159, Volume II

Sublethal "disruption", not "description"

16. Oil Entering Food Chain, page 164, Volume II

The statement is made that: "No evidence was found in the literature that spilled oil enters marine food chains via adsorption or absorption by phytoplankton and subsequent ingestion by herbivores." It is suggested that some discussion be included here regarding possible paths of entrance by oil into the food chain.

17. Entrained Oil, page 170, Volume II

Formation water is polished to not greater than "50 ppm" entrained oil, not "50 ppt" entrained oil.

18. Offshore Storage, page 296, Volume II

The statement: "Offshore storage is limited to the relatively small volumes maintained on producing platforms" may be invalid. The volume and extent of offshore oil storage will be dependent upon the choice of transportation mode. Marine transportation of oil to shore requires substantial offshore storage capacity; pipeline transportation requires substantially less.

I have enclosed the comments we have received from several components of the National Oceanic and Atmospheric Administration.

Thank you for giving us an opportunity to provide these comments, which we hope will be of assistance to you. We would appreciate receiving a copy of the final statement.

Sincerely,

Sidney R Galler

Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs

Department of Commerce - Assistant Secretary for Science and Technology

The Department of Commerce submitted two sets of comments, the first of which from the Assistant Secretary for Science and Technology is addressed here. The second, and more detailed, set of comments, came from the National Marine Fisheries Service; it immediately follows this disposition, and is followed in turn by the set of disposition comments.

The format being followed here is the same as that found in the Assistant Secretary's comments, viz. points one through eighteen.

Disposition

1. We recognize that in some cases the techniques and principles of operations in the Gulf of Mexico are not applicable to frontier areas. These differences are noted in several sections of the final EIS, including Section III on the area-by-area analyses of natural hazards and proximity of hypothetical drilling sites to vulnerable coastal features, alternative leasing strategies, and mitigating measures.

2. The statement has been moved to the subsection on drilling operations.

3. We contacted the various agencies that would be involved in re-examination of pipeline burial requirements, viz. USGS, Coast Guard, Corps of Engineers, and Office of Pipeline Safety (OPS). Both the Corps and Coast Guard said that those agencies were not presently examining this question, but would in response to a request from the Department of the Interior. The OPS and USGS are both working on new regulations for pipelines, and are examining burial requirements as one component of what is hoped will be one set of Federal regulations regarding all aspects of pipelines.

4. The statement regarding pipeline block valves relates specifically to remote controlled pumping facilities. At the present time, these would only be installed at or near the platform and onshore, or a little distance offshore. There are no indications that block valves will be installed with any greater frequency than the necessary frequency of pumping facilities to maintain flow. In most cases, this would mean that block valves would only be installed at the platform and at the shore, so the length and size of the pipeline is the determinant for the amount of oil that could be spilled from a pipeline rupture.

5. Some characterizations have been added on the design and projected capabilities of this "new generation" of oil spill containment and clean-up equipment. However, our basic emphasis in this EIS has been on the limits of these technologies at the present time, those which have been demonstrated in the field.

6. The final EIS takes special note of the fact that, in many areas, tankering and barging of production in the early stages may be the only mode of transportation, and that in some cases, tankering or barging will be the only mode used throughout the life of the fields. The added risks of oil spills inherent in tanker operations is factored into the discussion of oil spill potential for each of the 17 areas (Section III.).

7. This information has been updated as suggested.

8. Storm design is generally considered to be one of the more developed aspects of platform design. In recent years, severe hurricanes (particularly Camille in 1969) in the Gulf of Mexico have not resulted in serious oil polluting or loss of life events. North Sea experience is providing additional information for design criteria for areas where storms and generally rough sea conditions are more frequent or of longer duration. While conditions are difficult there, platform competence has proven quite acceptable.

9. These requirements for phytoplankton metabolic activity and the importance of phytoplankton to the world's oxygen supply are noted in several sections, including the first mention of phytoplankton in the description of the Atlantic coast, in the discussion of generic impacts (Section III) and in Unvaoidable Impacts (Section V).

10. The entire gamut of natural hazards is now the basis for one component of risk assessment in all OCS areas (Section III), and is thus significantly upgraded.

11. This information has been added.

12. This correction has been made.

13. The sections on Ports and Shipping have been modified to some degree. However, the question is an extremely complex one. Obviously, drilling and production facilities present some hazard to shipping. The reverse is true also, although both impacts are mitigated by the establishment of shipping fairways and the preclusion of leasing in the fairways. Platforms are well identified physically (lights and foghorns) and cartographically. Supply vessels will ply between shore and platforms. On the other hand, a significant expansion of OCS leasing will result in time in a decrease in shipping traffic bringing foreign crude oil and gas to this country. Much of the OCS production will eventually be piped to shore, although some regions may have production tankered or barged for the life of the field. All these variables and possibilities point to the conclusion that it is well nigh impossible to separate the effects of OCS development from the base case of what levels of shipping and port stress will ensue if the OCS is not developed.

14. The editorial correction has been made.

15. The editorial correction has been made.

16. The possible entrance and transmission of oil in marine food chains is discussed later under zooplankton, fish, birds and mammals, as well as in Section III, Generic Impacts.

17. This editorial change has been made.

18. Offshore storage is now discussed at length, along with the possible hazards or preclusions to such storage, in Section III, Description of Impacts.

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Science and Technology
Washington, D.C. 20230

1732

March 25, 1975

Mr. Curt Berklund
Director
Bureau of Land Management
Department of the Interior
Division of Minerals Environmental
  Assessment (730)
Washington, D. C. 20240

Dear Mr. Berklund:

The Department of Commerce reviewed the draft environmental impact statement of the Department of the Interior, relative to the Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf - (BLM DES 74-90), and forwarded comments on March 4, 1975.

However, the comments from the National Marine Fisheries Services (NMFS) were inadvertently not submitted. In view of their pertinence to the project, we are forwarding the comments developed by NMFS for your consideration in developing the final environmental impact statement.

Sincerely,

Sidney R. Galler
Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs

Enclosure

F34/RDK

FEB 24 1975

TO : EE - Office of Ecology and Environmental Conservation

Sgd. Walter Kirkness

FROM : Robert F. Hutton
Associate Director for Resource Management

SUBJECT: Comments on Draft Environmental Impact Statement — Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Shelf (BLM DES 74-90) (DEIS #7410.58)

The draft environmental impact statement for the Proposed Increase in Acreage for Oil and Gas Leasing on the OCS that accompanied your memorandum of November 11, 1974, has been received by the National Marine Fisheries Service for review and comment.

The statement has been reviewed and the following comments are offered for your consideration:

General Comments

The DEIS is useful in that it points out how little is actually known regarding potential environmental impacts of the proposed action. As frontier areas become candidates for lease sales, the environmental data gaps will have to be filled.

We suggest that the introductory passages of the EIS delineate the various OCS areas, and that ensuing sections and treatments be referable to such descriptions.

Important sport fishing resources should be addressed in appropriate sections of the EIS.

The various sections of the EIS that provide information on OCS development depend entirely on the ongoing operations in the Gulf of Mexico as a base of comparison with other areas of the country. For example, the EIS suggests that proposed Alaskan OCS operations will be similar, with limited modifications, to existing technology. A cursory review of North Sea and Canadian arctic oil development reveals a radical departure from the Gulf of Mexico operations. Concrete platforms, platforms built on land-fast ice, and man-made islands are examples of the different technology needed to withstand the arctic and subarctic environment.

Because of the unique oceangraphy associated with the arctic, we believe the problems of ice scouring, ice flows, pack ice, and pressure ridges should be addressed in relation to oil exploration and development in the Bering, Chukchi, and Beaufort Seas.

Furthermore, questions regarding oil and cold temperatures and oil and sea ice have not been adequately answered through any experience anywhere in the world. Because of this situation, it is virtually impossible to effectively hypothesize the fate and effect of oil on living marine resources of the arctic. This problem is compounded when it is realized that biological populations that potentially could be exposed to oil spills or petroleum development pollution have not been well characterized.

The potential damages to fishery resources resulting from the proposed action may be significant in scope; the EIS should evaluate this potential fully and propose mitigative measures for adverse impacts.

Inclusion of a glossary within the EIS would be advantageous to reviewers. Such an addition would obviate repetitive definitions, shorten the EIS, and provide a valuable supplement to the forthcoming site-specific EIS's.

Specific Comments: 1/

VOLUME 1
I. DESCRIPTION OF PROPOSED ACTION
A. Statement of Proposed Action
2. Scope of the Proposed Action

Pages 16-23. This section should identify the specific OCS areas included in the leasing program; descriptive tables and figures would be helpful.

3. Underlying Assumptions

Pages 26, paragraph 3. Generalizations regarding phytoplankton and primary production should be documented.

C. Description of OCS Oil and Gas Operations
1. Oil and Gas Operations
(1) Platform Installation

Pages 47-51. This section should present a more detailed description of drilling platforms used in the arctic vis-a-vis those used in the Gulf of Mexico. Inherent problems associated with platform construction in sea ice go beyond "...special precautions... to overcome the crushing and abrasive effects of ice." Topics that should

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1. Page numbers correspond to the manually scribed pagination in the DEIS.

be discussed include the placing of drilling platforms upon man-made islands, as has been done in the McKenzie Delta, and the possibility of placing platforms on land-fast ice off the Beaufort Sea coast.

(2) Development Drilling

Page 58, paragraph 1. The discharge of drilling muds, cuttings, and brine water containing between 50-100 ppm of oil into the surrounding waters of the platform (CEQ, 1974) should be mentioned in the section.

D. Other Management and Supervisory Aspects of the Program
2. Proposed Supervisory Procedures for OCS Resource Development
g. OCS Regulations of Other Federal and State Agencies
(5) Other Federal Agencies
(a) Fish and Wildlife Service (FWS)

Page 127, paragraph 3. It is stated that the U.S. Fish and Wildlife Service (Department of the Interior) "... has a broad mandate to study, protect and manage fish and wildlife resources. In the offshore environment these resources include sportfish, marine mammals, and marine birds." However, the Marine Mammal Protection Act of 1972 (P.L. 92-522) specifically authorizes the Secretary of the department in which the National Oceanic and Atmospheric Administration (NOAA) is operating (namely, Commerce) to carry out the mandates of the Act with respect to "... members of the order Cetacea (whales and porpoises) and members, other than walruses, of the order Pinnipedia (seals and sea lions)...". The Fish and Wildlife Service is authorized to protect and manage walruses, sea otters, polar bears, and sirenids. Also, with respect to marine sport fish, Reorganization Plan No. 4 of 1970 transferred the Fish and Wildlife Service's responsibilities to the National Marine Fisheries Service. The responsibility of NOAA noted above should be presented on page 128 as a primary concern of the National Marine Fisheries Service.

(c) National Oceanic and Atmospheric Administration (NOAA)

Page 128, paragraph 2. This paragraph should indicate that under the Fish and Wildlife Coordination Act and Reorganization Plan No. 4 of 1970, the National Marine Fisheries Service should be included in the reviewing process for OCS permits, in view of NMFS' responsibilities concerning the living marine resources affected by OCS energy-related development activities.

NOAA's National Marine Fisheries Service has had responsibility for migratory marine species of game fish (P.L. 86-359, 73 Stat. 642, U.S.C. 760e-760g) since the transfer of those related functions under the Reorganization Plan No. 4 of 1970. As pointed out above, NMFS is also responsible for the protection of cetaceans and pinnipeds otherthan walruses under the Marine Mammal Protection Act of 1972.

3. Related Management and Supervisiory Authorities
d. Endangered Species Conservation Act

Page 132, paragraph 3. The Secretaries of the Interior and Commerce share joint responsibilities under the Endangered Species Act of 1973 (P.L. 93-205, 87 Stat. 884).

II. DESCRIPTION OF THE ENVIRONMENT
A. Description of the Offshore Environment
1. Atlantic Region
d. The Biological Environment
(4) Active Swimmers-Nekton

Page 264, paragraph 3. Shad, striped bass, blueback herring, and alewives have not been reported to spawn in tidal marshes. Natural reproduction of striped bass for example, takes place in the flowing water of large streams 25-100 miles above tidal influence (Barkaloo, 1970).

Page 264, paragraph 4. The South Atlantic Region Shelf falls within the Caribbean and Carolinean zoogeographic zones (see page 248, paragraph 1).

Within this section and other sections dealing with nektonic animals, we suggest including a discussion of sea turtles (family Chelonidae). Information needed for a discussion of sea turtles can be obtained from the following references: Ingle and Smith (1949), Caldwell and Carr (1959), and Carr (1969).

2. Gulf of Mexico Region
d. The Biological Environment
(2) Zooplankton

Page 345, paragraph 2. The zooplankton review by Hopkins (1973) includes several studies on zooplankton from the shelf waters of the Gulf of Mexico. Therefore, we suggest that the information from Hopkins' review be included in this section.

Page 350, paragraph 1. The pink shrimp, Penaeus duorarum, should be included among the important commercial epifaunal species. As mentioned in Volume 1, page 771, about 11 million pounds of pink shrimp, comprising 7% of the total Gulf of Mexico shrimp catch, were harvested in 1972.

3. Pacific Region
c. Physical Oceanography
(1) Surface Sea Temperatures

Page 427, paragraph 1. Coriolis force is not synonymous with net transport. Moreover, upwelling is not confined to the area from Central California north, but extends through the Southern California Bight and south past Magdalena Bay in Baja, California.

(3) Surface Circulation

Pages 432-434. The significance of circulation as it relates to the potential onshore transportation of oil spills should be stressed. Natural variations in current velocities and directions also should be considered. Finally, such features as the Southern California Eddy and the vertical structure of the water column should be discussed.

(4) Tides

Pages 435-436. Tidal currents are not mentioned, except as being unimportant offshore. Onshore, however, significant lateral displacement and mixing occurs by tidal motion. Tidal current velocities may be greater than the mean velocities characteristic of the California current (page 436, paragraph 2).

d. The Biological Environment
(1) Phytoplankton

Page 448, paragraph 1. The statement that very large quantities of phytoplankton occur in Pacific coastal waters, especially during spring and summer, is, in our opinion, too general. Without baseline data collected over a sufficent period of time, natural seasonal fluctuations in coastal phytoplankton levels cannot be determined, thereby limiting the assessment of the effects of oil and gas operations on the phytoplankton populations.

Page 442, paragraph 1. The discussion of "red tide" is, in our opinion, oversimplified and should be expanded. The NMFS, Southwest Region, may be contacted for further information on red tide in eastern tropical and subtropical Pacific waters.

(2) Zooplankton

Page 443, paragraph 3. Neuston, the sea surface community that will be affected by oil, should be described and discussed.

(3) Benthic Biota

Page 446, paragraph 3. One factor influencing the distribution and abundance of benthos that is not identified in this section is water quality, especially as related to petrochemical pollutants.

Page 447, paragraph 2. This paragraph presents an incomplete description of the relationship between benthic organisms and surface water productivity. The role of scavengers and decomposers in the benthos, and their relationship to the surface communities should be described and discussed. Separate discussions should also be presented for the benthic organisms found among the various habitats of the OCS.

Page 447, paragraph 3. It is stated that "The benthos of Southern California has been relatively well studied by the Allan Hancock Foundation (1965)." On the following page (448, paragraph 2), it is stated that "Near Santa Barbara the vast majority of specimens, both in numbers and biomass (80%), consisted of the echiuroid worm Listriolobus pelodes. This species remained dominant in 1969 (Fauchald, 1971), but was greatly reduced compared to the early 1960's at the time of the Allan Hancock Foundation Study." If Listriolobus population levels changed greatly, how representative of existing conditions are the remainder of the cited Allan Hancock Foundation Study data?

(4) Active Swimmers - Nekton

Page 453, paragraph 2. Information on the abundance of species and trends in stock sizes, discussed in Squire (1972), should be presented. In addition to the information presented in the EIS from Squire (1972), several other recent articles are available that provide related information (see Kramer and Smith, 1970a, b, c, and 1971a, b, and c; 1972; and 1973).

4. Alaska Region
d. The Biological Environment
(4) Active Swimmers - Nekton

Pages 548-553. This section should present recent fish harvest data for foreign fleets, thereby emphasizing the importance of the living marine resources that could be affected by OCS development. A discussion should be presented on the ramifications of pending extended jurisdiction, which would undoubtedly encourage U.S. fishermen to harvest stocks currently being taken by other nationals. Subsistence fishing should also be discussed, as should native utilization of marine mammals that might be affected by OCS development in Alaska.

Marine Mammals

Page 557, paragraph 2. The occurrence of two distinct groups of harbor seals in the Bering Sea should noted. One group of seals, which bear white-coated pups on the ice, inhabits the ice front, whereas the second group of seals, which bear dark-coated pups on land, inhabits the southern coastal areas.

(6) Unique Environments

Pages 566-567. Sea ice is a unique environment that should be included in this section. Marine mammals' dependencies on sea ice and the role that sea ice plays in primary production in arctic waters should be noted (See McRoy and Goering, 1974).

e. Natural Phenomena Unique to Area with Potential to Cause or Contribute to Environmental Impacts of Proposed Action.

Page 568, paragraph 2. The discussion dealing with ice should include not only pack ice but also land-fast ice and polynya. The discussion should contain information on the percentage of ice-covered waters and the annual duration of ice in the Bering, Chukchi, and Beaufort Seas.

B. Description of Nearshore and Coastal Zone Environment
1. Atlantic Region (and Sub-Areas)
b. Biological Environment and Communities of the Coastal Zone
(3) Mangrove Swamp Systems

Page 575, paragraph 1. The conclusion that the mangrove community has sustained a loss of over 75% of its original area due to man's activity should be documented.

(8) The Oyster-Mussel Reef

Page 583, paragraph 3. The conclusion that oysters show marked preference for the setting of larvae upon their own shells should be documented.

(9) Worm and Clam Flats

Page 585, paragraph 1. It is stated that "These communities are actively fished and evaluations of their economic value can be based upon a $2,900 to $3,750 per acre commercial annual yield." Placing a monetary value on the clam beds, in a sense, evaluates natural resource productivity in the area. The indirect economic benefits derived from phytoplankton production, macrophyte production, and spawning and nursery habitat for fish and invertebrates may well exceed the net value of clams harvested; although these benefits are not measurable, they should be acknowledged.

c. Resources of the Coastal Zone
(4) Commercial Fisheries - Atlantic Coast

Page 675, paragraph 1. Since the value of the commercial fishing industry will be an important consideration in leasing drill sites, this section should also include discussion of potential fisheries presently not harvested or only minimally utilized.

d. Existing Environmental Quality Problems in Coastal Zone
(1) Water Quality

Page 704, paragraph 2. Reference to red tide blooms (Gymnodinium) implies a direct relationship between pollutants and periodic outbreaks. Steidinger (1973) offered no such conclusion, noting instead the possibility that nutrients, particularly chelated trace metals, may be implicated.

Page 705, paragraphs 1-2 and page 706, paragraphs 1-2. Although the statement regarding the Outer Banks not being "heavily influenced by man" is relatively true, there is no parallelism between this statement and information in the following paragraphs on Chesapeake Bay. How many acres of the "Outer Banks System" (Sound and adjoining rivers) are closed to shellfishing in this area? The number is no doubt substantial and should be reported similarly for all areas included in the EIS.

2. Gulf of Mexico Region (and Sub-Area)
b. The Biological Environment and Communities of the Coastal Zone
(5) Mangrove Swamp

Pages 724-725. Information on the mangrove swamps should be documented

(7) Seagrasses

Page 729, paragraph 4. Whereas we agree that seagrass communities are fragile ecosystems, we disagree that they advance readily in response to minor changes in water quality. Kelly, Fuss, and Hall (1971) reported regrowth of turtle grass (Thallasia testudinum) at an annual rate of 20 cm or less.

Page 756, paragraph 1. Few data are available for the Gulf of Mexico area; therefore, we suggest referencing the study by Fable and Saloman (1974) that treated recreational fisheries on three piers near St. Petersburg, Florida.

Page 758, paragraph 1. The conclusion that population sizes of fishes are not increased by artificial reefs should be documented.

(4) Commercial Fisheries

Page 768, paragraphs 1 and 3. The leading fishery in 1973, by value, was shrimp (Table 53, page 769). The shrimp fishery accounted for 72.7 percent of the value of fishery products in this same year (Table 54, page 769).

d. Existing Environmental Quality Problems in the Coastal Zone
(3) Dredging

Page 803, paragraph 1. The conclusion that there were no adverse effects of dredging on aquatic animals in Mobile Bay should be documented. May (1973) reported that insufficient circulation in Mobile Bay caused by shoals and dredged spoil banks resulted in widespread oxygen depressions. He also noted that this condition has been occurring for over a century and has caused considerable fishery losses. May (1973) concluded that future bottom modification from channel spoil could worsen conditions and cause continued fishery losses.

Volume II

B. Description of Nearshore and Coastal Zone Environment
3. Pacific Coast Region (and Sub-Area)
b. Biological Environment and Communities of the Coastal Zone
(1) Terrestrial Communities

Page 10, paragraph 1. This section does not reflect the vast anadromous fish resources of the Northwest Pacific, including five species of salmon and three species of trout. American shad and striped bass are also common along the Northwest Pacific Coast. The reference to silver salmon should be changed to coho salmon.

(3) Bays and Estuaries

Page 17, paragraph 2. The fishes that are estuarine-dependent during any portion of their life cycle should be mentioned.

(4) Commercial Fisheries
CALIFORNIA

Page 19-21. This section on commercial fishing is incomplete. More recent data is available on such topics as economic importance of the various fisheries, areas of greatest commercial importance, trends in harvesting over the years, and the current stock estimates for California commercial fisheries from the California Department of Fish and Game. Many of these topics are addressed in a publication entitled "Coastal County Fish and Wildlife Resources and Their Utilization." (This publication is in the literature cited section of the EIS under California Department of Fish and Game, 1973.)

Page 19, paragraph 3. The discussion of fishes under the various commercial headings (e.g., pelagic, bottomfish, etc.) is incomplete. As an example, the pelagic fisheries should also include Pacific bonito, yellowtail, barracuda, and white sea bass.

NORTHWEST PACIFIC

Pages 21-23. This section does not indicate the importance of the OCS in the northwest Pacific to the stocks of fish. To correct this deficiency, this section should be revised to indicate that the fast-flowing streams of clean, cool freshwater and the narrow continental shelf with cool, upwelled nutrient-laden marine water provide an environment for valuable anadromous fish populations along the Northwest Pacific Coast. Five anadromous species of salmon and three species of trout spawn in freshwater and mature in the Pacific Ocean. Stocks of indigenous species of anadromous fish reached low levels in the early 1960's, but due to successful management efforts of Federal and State fish conservation agencies, many populations are now increasing to their former levels of abundance.

Extensive troll fisheries for salmon, both commercial and sport, are conducted over the OCS to depths of over 200 meters from about April to November, the seasons varying depending on the species and locality being fished. Sport fishing for salmon and trout occurs in the bays, estuaries, and Puget Sound, as well as in freshwater rivers.

Commercial gill net fishing for salmon is unlawful in the ocean and closely regulated in inland waters by Oregon and Washington agencies. Reef net and purse seine commercial fisheries are still being conducted for some species in the Puget Sound area. However, fishwheels, salmon traps, and beach seines are no longer legal for harvesting salmon in the Northwest Pacific. The Northwest Pacific commercial catch in 1972 was over five million salmon and trout weighing about 49 million pounds. In addition, sport fishermen caught nearly two million fish. 2/

American shad and striped bass were introduced from the Atlantic Ocean and now sustain expanding commercial and sport fisheries.

Many marine fishes live in the waters of the OCS in the Pacific Northwest. Important commercial fish species, such as sole, rockfish (including Pacific Ocean perch), Pacific cod, sablefish, ling cod, halibut, and Pacific hake are taken by otter trawls, long lines, and pots. Fishing with these methods is generally conducted at depths of 10 to 250 meters, but may be conducted as deep as 1,000 meters at different seasons of the year. The 1972 harvest of groundfish was about 56 million pounds.

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2. All fishery production figures cited in this discussion were obtained from catch statistics published annually by the Pacific Marine Fisheries Commission, Portland, Oregon

Stocks of these fish have been so extensive that foreign fleets have moved into OCS waters of the Pacific Northwest since about 1960, heavily competing with domestic fisherman and, in some cases, destroying their long lines and pots.

Major crustaceans harvested commercially over the OCS include Dungeness crab and pink Pandalid shrimp. Crabs are fished by pots set in 4 to 100 meters of water, whereas shrimp are harvested by otter trawls at depths of 75 to 180 meters. Seasons and catch of both are regulated by State fishery agencies. Over 31 million pounds of shrimp were trawled off the OCS in 1972. Mature male crabs are harvested along the shores and in the higher salinity portions of estuaries. The annual populations of crabs, and consequently the catch, is cyclic, depending upon the severity of the environment during their earlier juvenile stages. Minor species of crab and shrimp are harvested commercially on a limited basis in selected locations where populations are large. Sport harvest of Dungeness crab and other inshore crab and shrimp is significant along the shores of the inland waterways.

Molluscs found along Oregon and Washington ocean beaches include razor clams, butter clams, and littleneck clams. The commerical harvest of razor clams has declined because of competition from increasing numbers of sport diggers who harvest an even-larger portion of the annual production. Butter, littleneck, Manila, and goeduck clams are harvested commercially, principally on Puget Sound beaches. Some dredges have been tried experimentally in Washington waters with promising success. Native (Olympia) oysters and the larger Pacific oysters (imported from Japan) are grown commercially on privately owned or leased estuarine tidelands. Advanced methods of mariculature of oysters growing on suspended strings of culch are being tested in several speculative enterprises.

Pelagic fisheries of the Northwest Pacific include albacore (during their summer migration into the area), Pacific herring, and northern anchovy. Only albacore and Pacific herring have been landed in large quantities. Albacore are generally caught by trolling lines using surface jigs. Pacific herring are caught in bays and coastal waters with purse seines, weirs, gill nets, and dip nets. No intensive fishery for northern anchovy has developed, even though they are abundant off Washington and Oregon coasts during the winter.

c. Resources of the Coastal Zone
(2) Recreation Resources
Oregon

Page 46, paragraph 1. The reference should read "(Col.-North Pac-Comp...)" rather than "(Cal.-North Pac-Comp...)."

d. Existing Environmental Quality Problems in the Coastal Zone

(1) Water Quality

Pages 98-107. This entire section depicts the water quality situation as it existed several years ago. Under the National Pollutant Discharge Elimination System administered by the U.S. Environmental Protection Agency, water quality should improve markedly; the EIS should address this possibility. (This comment applies to all U.S. waters.)

III. Environmental Impact of the Proposed Action

A. Impact on the Living Component of the Environment: An Introduction

Page 162, paragraph 1. The statement that "It is important to point out that predictions of affects at the community, or even population, level can not be determined from the existing literature" emphasizes the necessity of obtaining the biological baseline data required for an adequate assessment of potential environmental impacts of OCS leasing actions.

Page 163, paragraph 2 and page 164, paragraph 1. The contention that the potential impacts of the proposed leasing would be no more than the impacts associated with the ten million acres leased in the Gulf of Mexico is unsupported by existing data.

Page 164, paragraph 1. The conclusion that commercial fish catches of all types have either held steady or increased over the last 25 years, both in total catch and catch per unit effort, should be documented. (Similar statements appear on page 193, paragraph 2, and page 281, paragraph 3.) An examination of trends in catch and fishing effort in the Gulf of Mexico shrimp fishery by Nichols and Griffin (1974) revealed that the 1954 record catch has not been exceeded. These authors also concluded that the amount of shrimp caught for each unit of effort expended has generally declined over the last decade: catch per unit effort declined by 50 percent during the 1967-1973 period. (Effort remained high because of increasing prices and gross revenue.)

Page 165, paragraph 3. It is stated that "Pipelines crossing beaches and wetlands cause short-term one time effects...". In practice, this may not be true: pipelines occasionally leak and require periodic maintenance.

Page 166, paragraph 3. The comment that drill cuttings are discharged overboard after being cleaned of any entrained oil should be qualified by stating that current Federal regulations permit the discharged waste water to contain 50-100 ppm of oil.

Page 167, paragraph 2. The discussion of onshore losses of habitat from associated OCS development should address the possibility of extensive marine dredging and filling, as reported by Baldwin (1974).

B. Impact on the Offshore Environment
1. Description of Impacts
a. Pelagic Marine Life

Page 175, paragraph 4. The statement is made that "...the plankton populations in the various geographic areas will be able to absorb the impact of a major oil spill and recover fairly rapidly." This conclusion should be qualified to take into account the complexity of the marine plankton community. For example, if a major oil spill occurs at a prime spawning area during the spawning season, the loss of bouyant eggs and larvae could be significant, particularly if the species affected is of commercial importance and its populations subject to other stresses, such as overfishing.

Page 176, paragraph 3. In our opinion, the maximum amount of 50 ppt. for entrained oil in formation water cannot be termed a "trace" amount.

(2) Impact on Nekton

Pages 178-181. We suggest including a discussion on marine sea turtles, for they are nektonic and can be adversely affected by oil spills. An oil spill in the open sea could foul adults and post hatchlings which must surface to ventilate. A spill could also foul their food organisms, such as crabs and scyphozoans. Illuminated offshore structures may disturb the ability of adults and post hatchlings to find the sea. Increased boat traffic (support vessels, tankers, and barges) in areas frequented by adults and subadults could also cause mortalities.

Pages 178-181. The information presented in this section indicates that free-swimming organisms will avoid contaminated areas, thus minimizing the impacts. If spawning areas are contaminated, however, it is conceivable that the organisms, rather than move to other areas, will not spawn at all (resorption of eggs), or will undertake only very limited spawning.

Page 181, paragraphs 1 and 2. It is stated that "No information has been found on spilled oil affecting the nekton other than finfish," and "it is difficult to predict effects of an oil spill on marine mammals; however, we presume it will be negligible as long as the mammals are able to escape the area of the spill." Moore, Dwyer, and Katz (1973) hypothesized that a coat of oil can significantly change the insulating properties of the fur of marine mammals, causing the animals to lose heat and lowering their resistance to disease. Furthermore, in reference to the Santa Barbara spill, Straughn (1971) noted that although many weaned elephant seal pups were coated with oil and apparently not harmed, immediate mortality could have been much higher had the oil spill taken place at a time when the pups were feeding. Moreover, Odell (in Straughn, 1971) reported a tripling in the number of premature births of sea lions which have rookeries on the islands in the Santa Barbara Channel. Finally, it should be pointed out that because an animal is able to escape a potentially dangerous situation does not necessarily mean that the animal will escape. The oil-coated elephant seal pups noted above, for example, did not leave their degraded rookery.

Page 181, paragraph 3. The final statement in this section concludes that the overall impact of OCS development will be minimal. This statement may not be valid for Alaska's offshore areas because, for the most part, it is based on data observed or collected in areas other than the arctic environment. Some fundamental biological processes may differ among these areas, in addition to there being a difference in species composition. For example, Aleutian productivity is periodic, whereas Gulf of Mexico productivity continues throughout the year. These fundamental contrasts imply that little generalization is possible in relating the effects of oil contamination from one area to another (Kash et al., 1973).

2. Benthic Marine Life

Page 184, paragraph 2. Barium is more likely to be a problem in terrestrial systems where calcium is sometimes deficient. In marine systems, one would not expect barium to be a "serious threat." However, barium is one of several drilling mud components whose effects should at least be investigated.

C. Impact on Nearshore and Coastal Zone Environments
1. Description of Impacts
a. On Biological Communities of the Coastal Zone
(1) Beaches and Associated Biota

Page 200, paragraph 1. The statement regarding potential "adverse impacts" on the "kelp beds of California" should be expanded to discuss the nature and extent of the impacts. If kelp beds may be adversely impacted, then the impacts on the organisms that depend upon this habitat should be described and discussed.

Pages 197-200. Acute pollution from a spill entering the nearshore zone could interfere with mating activities of sea turtles, which are beach-dependent for egg laying and incubation. A heavy spill could also foul the beaches and interfere with nesting activities of female sea turtles and migration of hatchlings into the water.

(2) Bays and Estuaries

Pages 200-205. Acute or chronic toxicities to submerged grasses within bays and estuaries could have an adverse effect on at least one species of sea turtle. The green turtle, *Cheloniamydas*, is mainly a herbivore, subsisting largely on marine grasses of the genera *Thalassia* and *Zostera* (Carr, 1969).

(6) Endangered and Threatened Fish and Wildlife

Pages 216, table 79. All of the whales listed are now classified as endangered species and are under the jurisdictional responsibility of the Secretary of Commerce. In addition, the bowhead whale, *Balaena mysticetus*, should be included in the list.

A definitive discussion of the effect of oil leasing and future operations on endangered species should be provided.

2. Summary of Aggregate and Cumulative Impacts of Expanded Program and Comparison with Impacts Under Current Leasing Program
a. On Biological Communities of the Coastal Zone
(2) Bays and Estuaries

Page 256, paragraph 2 and page 257, paragraph 1. References should be provided to support the statements made in this section on bays and estuaries.

(3) Wetlands

Page 257, paragraph 3. The conclusion that "reproduction and survival of commercial fisheries has not been severely affected" by oil and gas production in the Gulf wetlands as evidenced by "the success of the commercial fishing operations" is not supported by Nichols and Griffin (1974).

Page 258, paragraph 1. The fishery resources of the Gulf that are not being fully utilized should be identified.

(4) Artificial and Hard Substrate Communities

Page 258, paragraph 2. This paragraph contradicts paragraph 3 on page 259. In the former, the argument is presented that substrate communities are not a significant part of any ecosystem in terms of biomass and energy dynamics. In the latter, future platforms are predicted to "...act as artificial reefs by allowing a surface for settlement of sessile organisms. Eventually a community develops and this food source attracts large schools of sport fish...".

E. Impact on Commercial Fisheries

2. Impact (socio-economic) on Commercial Fisheries

Page 275. A statement should be made in this section acknowledging that the platforms may provide shelter to commercial species, thereby perhaps removing a portion of the population from the harvestable supply. For example, association of jack mackerel, *Trachurus symmetricus* (Ayres), with platforms in the Santa Barbara Channel could have an impact on the commercial fisheries of the Cortex and Tanner Banks in Southern California.

b. Creation of Obstructions

Pages 276-277. The draft EIS states that "Unburied pipelines (beyond the 200 foot depth contour) may pose a problem to bottom trawl fishermen. However, about 90% of the Gulf of Mexico shrimp catch was harvested inside the 120 foot depth contour." It should be noted that due to both increasing demand for shrimp and improved equipment and other technology, the Gulf shrimp fishery is rapidly extending into deeper waters. For example, in 1971, less than 1 percent of shrimp catches in and off Louisiana and Texas came from depths of 36 to 50 fathoms (216-300 feet). In 1972, nearly 2 percent of the catch came from these depths. By 1973, deep-water catches had risen to over 5 percent of the total catch (9 percent of the brown shrimp catch came from 36 to 50 fathoms). The 1973 catch from 216-300 foot depths represented over 4 million pounds of shrimp (heads off) that were worth about $8.5 million to the fisherman; the retail value was over twice this amount.

The commercial shrimp fishery is expected to continue to extend into deeper Gulf waters, we recommend that burial of pipelines to the 300-foot contour be required, where feasible.

At a public hearing held in Corpus Christi on September 26, 1974, concerning Lease Sale No. 37, Offshore Texas, a spokesman from a major pipeline company (W. P. Heimman, Vice President, United Gas Pipeline Company) testified that in the North Sea, pipelines are being buried below the sea bed in waters out to the 300-foot depth contour. Apparently, burial of pipelines in water deeper than 200 feet is technically and economically feasible.

Since both the commercial fishery and the oil and gas industries are rapidly increasing their activities in waters deeper than 200 feet, any delay in requiring burial in deeper waters will increase the probability of frequent conflicts between these two important industries.

d. Reduction of Fishing Effort Due to Spilled Oil

Page 278, paragraph 2. Other examples of fisheries which could suffer gear damage include the southern California San Pedro day fleet and the seiners who fish seasonally for bonito, *Sarda chiliensis*.

3. Summary of Aggregate and Cumulative Impacts of Expanded Program Comparison with Impacts Under Current Leasing Program

b. On the Socio-Economic Aspects of Commercial Fisheries

Page 280, paragraph 2. We suggest that the proposition that 1,600 new platforms will remove 8,000 acres of seafloor from fishing activities be modified. On page 275, paragraph 2, it is stated that depending on depth, permanent production platforms remove from 2 to 325 acres from fishing activity. If 1,600 platforms * were installed, the possibility exists that from 3,200 to ~~5,200,000~~ (520,000] acres would be lost. The estimate of 1,600 new platforms is questionable. On page 288, paragraph 1, it is stated that 150-250 new platforms could result from leasing one million acres. This estimate predicts the possibility of 1,500 to 2,500 new platforms within the proposed 10 million acre lease area. On page 311, paragraph 2, the EIS notes that "500 platforms may eventually result from this proposal," and on page 319, paragraph 2, that "Estimates run from 500-1,000 on the number of platforms...". The estimates given for the number of new platforms should be consistent throughout the EIS.

V. Unavoidable Adverse Environmental Effects

E. Interference with Commercial Fishing Operations

Page 319, paragraph 1. Gill netting, purse seining, and long lining are other types of commercial fishing operations that will suffer interference and inconvenience from oil and gas operations.

H. Interference with Recreation Activities

Page 322. Explicit reference should be made to unavoidable adverse effects on recreational fishing activities.

VI. Relationship Between Local Short-Term Use and Maintenance and Enhancement of Long-term Productivity

Page 327, paragraph 1. The statement that the "productivity of coastal lands in the area disturbed by pipeline operations will actually increase following the disturbance..." should be documented.

VII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES
A. Mineral Resources

Page 329, paragraph 1. The estimate for the eventual extraction and depletion of up to 50 billion barrels of oil conflicts with the statement on page 314, paragraph 1, indicating that "The best available estimate... is between 10 and 15 billion bbl. of oil." Earlier, (in Volume 1, page 31, paragraph 3), in direct reference to the OCS, it is stated that the U.S.G.S. "has estimated (March, 1974) that offshore petroleum recoverable resources in the OCS to 200 meters water depth as yet undiscovered total 50 to 116 billion barrels." We suggest that the EIS define the OCS area and give a consistent estimate of the quantity of petroleum resources available.

VIII. Alternatives to the Proposed Action
A. Alternative Sale Scheduling to Increase OCS Leasing
1. Description
b. Preliminary Lease Area Ranking

Page 336, paragraph 1. The study prepared by the President's Council on Environmental Quality (CEQ) on potential OCS petroleum development rated production on Georges Bank as least environmentally harmful. However, this rating was developed purely on the basis of distance from shore and spill trajectory modeling. This rationale indicates only that the potential impacts to coastal waters and shorelines are minimal but does not account for destruction of valuable resources and habitat on Georges Bank itself.

It is noted in the DEIS (page 163, paragraph 1) that "The most severe impacts that can affect organisms and communities of marine and coastal ecosystems are those that result from spilled oil" and (page 178, paragraph 2) that "meroplankters... are generally considered to be most sensitive to environmental stress and predation...". The toxic effects of oil on larval stages of many marine organisms have been extensively studied. Moore, Dwyer, and Katz (1973) summarize the results of many of these studies. Several investigators reported that larvae appear to be 10-100 times more sensitive than adults (Kuhnhold, 1972; Corner, Southward, and Southward, 1968), and that larvae may develop abnormally, leading to death several weeks after exposure.

Most commercially important species of finfish in offshore New England waters spawn in the vicinity of Georges Bank. Further, high volume species such as cod, silver hake, yellowtail flounder, mackeral, ocean perch, and others, release bouyant eggs and/or produce larval forms which remain in the upper part of the water column for extended periods of time (Bigelow and Schroeder, 1953). These meroplankters could be significantly affected by massive oil spills.

VIII. Alternatives to the Proposed Action
D. Postpone Increase in OCS Leasing
1. Description
c. Pending Development of Land Use and Growth Plans Onshore

Page 348, paragraph 2. With regard to the statement that postponement of leasing pending development of onshore land use and growth plans may result in a piecemeal development of offshore mineral resources, the possibility that delay in the total leasing program will have little affect on offshore resource development, except in relation to production timetables, should be addressed. The converse situation should also be addressed; namely, that a delay in the leasing program will provide sufficent time not only for the orderly placement and controlled development of supportive onshore facilities but also for needed baseline studies. Comprehensive regional planning, a major recommendation listed in the conclusions of Resource Planning Associates, Inc. (Vol. II, page 233), would appear to be of primary importance, since onshore facilities, as projected in Table 82 (Vol. II, pp. 234-236), will eventually affect, both directly and indirectly, thousands of acres of coastal properties and associated waters. These adverse impacts will probably reduce productivity in the coastal and estuarine ecosystems that are so essential to sustaining the commercial and recreational fisheries of the Nation.

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National Marine Fisheries Service (NMFS)

The NMFS of the Department of Commerce, NOAA, submitted a detailed set of comments covering a wide range of issues. These are addressed below, following the same format as NMFS has used (page number, paragraph). Many of the comments are of an editorial nature (typographical errors, misspellings) and are simply noted "Editorial", meaning the correction is accepted and has been accomplished.

Disposition

General Comments

The various OCS areas are delineated in the proposed leasing schedule at the beginning of the final EIS; all discussion of environmental description and impact assessment is cued to these areas.

Sport fishing resources are discussed for each region in Section II (Description of the Environment), Section III (Evaluation of Resources and Impacts) and Section V (Unavoidable Impacts).

In most cases, existing or recently developed technology will be capable of performing drilling and production operations on the U.S. OCS. Some of the more exotic designs are discussed in Section III relating to natural hazards. Design criteria must take into account the worst expected conditions with additional safety factors. These design criteria, when translated into a drilling or production facility, must meet various Federal requirements, the most significant coming during approval of development plans submitted to USGS.

The various problems associated with ice in these forms are discussed in Section III on Impacts.

We agree that it is virtually impossible to hypothesize the fates and effects of oil on the marine ecosystem of arctic regions.

The potential damages to commercial fisheries are discussed in Section III in generic terms; the problems of quantifying these impacts are also discussed.

We appreciate this suggestion from NMFS and have entertained it. We feel that the lay public and decisionmaker is better served by an additional effort on our part to make the discussion as completely non-technical as possible. This is what was attempted in the final EIS.

Specific Comments

Before we proceed with the disposition of specific comments, it must be noted that NMFS (page 2, of comments, footnote) used the manually scribed pagination to delineate their comments. This pagination appeared in some copies of the draft EIS, with printed page numbers also [illegible] pages. In order to identify the comments, the format will be page numbers as used by NMFS, followed, in parentheses, by correct printed numbers that all copies have.

Pages 16-23 (6-13) - These identifications have now been made.

Page 26 (16) - The title of this sub-section is "Underlying Assumption". There is precious little information regarding population or community effects such as on phytoplankton. Although species may be different, it is felt that certain assumptions such as these can and must be prudently made, given the lack of information on population or community level effects, but also given professional assurance that there will be some level of effect.

Page 47-51 (37-41) - A brief description of these techniques has been added in this section on operations; the problems are also discussed in Section III on Hazards to Development.

Page 58 (48) - Editorial - This is a mitigating measure.

Page 127 (116) - These editorial corrections regarding explicit responsibilities of the agencies have been accomplished.

Page 128 (117) - Editorial.

Page 132 (121) - Editorial.

Page 264 (252), paragraph 3 - Editorial.

Page 264 (252), paragraph 4 - Editorial.

Page 345 (333) - The Hopkins material was at hand during preparation of the draft EIS; however, the detailed material was not necessary at this point to convey a general idea of the important zooplankton components.

Page 350 (338) - An editorial oversight was committed.

Page 427 (415) - Editorial.

Pages 432-434 (420-422) - The significance of circulation in relation to oil spill transport is taken into account in the proximity analysis in Section III; Section II is mainly descriptive in scope.

Pages 435-436 (423-424) - Tidal currents are discussed in the nearshore section (II.B.3.b.) on intertidal organisms.

Page 448 (436) - This programmatic EIS does not focus on detailed information of the sort requested, but rather addresses these general conditions. A large amount of information has already been reported on phytoplankton in Pacific waters, sufficient to make this characterization.

Page 442 (430) - Discussion has been expanded.

Page 443 (431) - Editorial.

Page 446 (434) - Editorial.

Page 447 (435) - Discussion has been expanded.

Page 453 (441) - This EIS attempts to present an overview of biotic resources, and not data on abundances and trends in stock sizes for a large number of species. These data are more appropriate to a site-specific EIS.

Page 548-553 (536-541) - Fish harvest data is presented in the resources section, subsistence fishing is discussed under Alaska socio-economic conditions, and extended jurisdiction is discussed under management authorities.

Page 557 (545) - Editorial.

Pages 566-567 (554-555) - Editorial.

Page 568 (556) - Editorial.

Page 575 (564) - Editorial.

Page 583 (571) - Editorial.

Page 585 (573) - This point is well taken, and often overlooked or unaccounted for when these habitats are valued. The requested acknowledgement has been added.

Page 675 (663) - Unharvested or minimally utilized fisheries exist in all OCS regions. This seems to be extraneous detail that could be more deeply addressed in a site-specific EIS on each region.

Page 704 (692) - Editorial - a semantic argument could be raised concerning whether a nutrient that permits a bloom of noxious algae couldn't be termed a pollutant.

Page 705 (693) - Editorial.

Pages 724-725 (712-713) - Editorial.

Page 729 (717) - Editorial - although 20 cm (=8 inches) of growth annually could be considered significant.

Page 756 (744) - We fail to see how this study on recreational fishing on three piers in St. Petersburg, Florida is very indicative of the Gulf of Mexico recreational fisheries.

Page 758 (746) - The last two sentences referred to only make the case that artifical reefs attract and concentrate fish populations; there is no data, to our knowledge, that fish populations increase due to the concentration.

Page 768 (756) - Editorial.

Page 803 (791) - Editorial - information now included.

VOLUME 2

Page 10 (4) - Editorial.

Page 17 (11) - Editorial.

Pages 19-21 (13-15) - It was felt that this type of information was too detailed for presentation here, and could more adequately be described in a site-specific EIS.

Page 19 (13) - Editorial.

Pages 2123 (15-17) - The section of fishery resources of the Pacific coast has undergone substantial revision (II.B.3.e.(9)).

Page 98-107 (92-101) - Editorial.

Page 163 (157) - Many scientists plead ignorance concerning effects at population and community levels due to lack of information. However, the systematic gathering of baseline information has little value in and of itself to predict the full range of consequences of OCS development. Only through properly designed complementary monitoring studies after development ensues and through special studies (such as toxicity work) can the impacts of OCS development begin to be discerned. Baseline studies can give needed information on population and community dynamics, but will generally not permit assessment of effects.

Page 163 (157) - This statement was unsupported, and has been deleted.

Page 164 (158) - Editorial - these statements have been corrected with reference to the cited document.

Page 165 (159) - Editorial.

Page 166 (160) - Editorial.

Page 167 (161) - Editorial.

Page 175 (169) - In the revised impacts section, the ichthyoplankton is addressed, as is the possibility of serious damage during this vulnerable stage. Year-classes could be severely depleted, given a combination of deleterious circumstances.

Page 176 (170) - Editorial - should read "50 ppm".

Page 178-181 (172-175) - This information has been added.

Pages 178-181 (172-175) - The discussion has been revised to a less monolithic position regarding motile organisms and their ability to avoid contaminated areas.

Pa e 181 (175) - Although two of the three references cited discuss hypothetical impacts, their possibility is of sufficient concern that they have been included in Section III on Generic Impacts as possible impacts.

Page 181 (175) - Aside from species composition differences, one of the primary differentiations of the various OCS areas and impacts on biotic resources is temperature and attendant phenomena. Colder climes do have more seasonal and restricted processes; microbial processes are slower and effects of oil under ice are still unknown to large extent. This added vulnerability of arctic ecosystems is discussed in Section III on Generic Impacts.

Page 184 (178) - In light of a lack of documentation regarding the threat of barium in the marine environment, and having the benefit of some toxicity data (Fisk and Lawrence, 1973) on barium, we wish to continue to denote barium as a potential serious threat.

Page 200 (194) - This discussion has been expanded (Section III.c.).

Pages 197-200 (191-194) - This material has been added, along with the material from comments 178-181 above.

Pages 200-205 (194-199) - See immediately preceding response.

Page 216 (210) - Editorial.

Page 256 (250) - Editorial.

Page 257 (251) - See previous response re: page 164 (158).

Page 258 (252) - Editorial - the statement should have read "What is not known is if the maximum sustainable yields of the fisheries are being reduced; if the fishing effort and current catches are not fully utilizing the resources in the Gulf, then we have a less than adequate base for judgment."

Page 258 (252) - This statement has been modified; these communities are more important than was implied.

Page 275 (269) - Editorial.

Pages 276-277 (270-271) - Editorial - We appreciate this information concerning trends in fishing depths. Given such trends to deeper waters, the 200 foot depth requirements for burial needs serious re-examination. The NMFS recommendation is now on the record for further action.

Page 278 (272) - Editorial.

Page 280 (274) - These estimates of numbers of platforms have been withdrawn, as they were supplied in response to the level of development that would be necessary to handle ten million acres of newly leased land. See Definition of Proposal, Section I.

Page 319 (311) - Editorial.

Page 322 (314) - Editorial.

Page 327 (319) - This has now been documented (Mackin, 1950).

Page 329 (321) - New estimates have been supplied by USGS and consistently applied throughout the final EIS.

Page 336 (328) - This fault of the CEQ assessment regarding Georges Bank has been identified.

More complete information is provided regarding the sensitivity of meroplankters and other larval forms.

The ichthyoplankton, especially the buoyant and near surface eggs and larvae are discussed in greater detail.

Page 348 (340) - Alternatives based on delaying the OCS program for baseline information or Coastal Zone Management Plan implementation are addressed in new fashion in Section VIII on Alternatives.

OFFICE OF THE DIRECTOR

United States Department of the Interior

BUREAU OF MINES
WASHINGTON, D.C. 20240

December 16, 1974

DES 74-90

Memorandum

To: Director, Bureau of Land Management

Through: Deputy Assistant Secretary--Energy and Minerals

DEC 2[illegible] 1974

From: Director, Bureau of Mines

Subject: Draft environmental statement, Bureau of Land Management, proposed increase in acreage to be offered for oil and gas leasing on the Outer Continental Shelf

The subject statement, prepared by the Bureau of Land Management, examines the environmental impacts of expanding Outer Continental Shelf oil and gas leasing to the point where 10 million acres would be leased in 1975. The Atlantic, Pacific, Gulf, and Alaska coastal waters are included, some of which will be so-called frontier areas resulting in significant changes in physical, social, and economic environments. Because of their special expertise, this 2-volume statement has been reviewed by our Dallas Mineral Supply Field Office.

The statement is generally well prepared and many of our comments are editorial in nature. Nevertheless, we believe their adoption will improve the final version of the statement. Detailed comments are attached for your consideration.

Thomas V. Falkie

Thomas V. Falkie
Director

Enclosures

Comments on "Draft Environmental Statement," Vol. 1 of 2, captioned "Proposed Increase in Acreage to be offered for Oil and Gas Leasing on the Outer Continental Shelf - DES 74-90"

As a prelude to our specific comments, there are three general observations for your consideration:

1. The English and metric units of measurement are used in the reports. As the English system is the standard, we suggest all measurements be given in this system followed by the metric in brackets.

2. Some problems exist in the numbering of figures and tables. These illustrations should be reevaluated and renumbered, which will affect the entire report..

3. Four different ways have been used in reporting salinity. The four units of measure used are ppt, ppm, ppb, and 28^{0}/00. According to API the standard unit of measure for reporting salinity is parts per million (ppm), and this is suggested for consistency.

PP. 25, last paragraph

"In addition, NOAA recommends. . . . . development sites. . . .in small clusters separated by no less than 50 miles." In developing offshore hydrocarbons, wells must be drilled where the hydrocarbon structures are located. The outline of the field will have to be followed and a hard-and-fast rule of 50 miles between activities seems illogical. If this rule were used for offshore Louisiana, most of the oil that is being produced would not have been discovered. Contrary to having adverse effects upon fishing in the Gulf of Mexico, the many platforms and wells have increased fishing.

Page 35, 2nd line....viz. 1:

1. Blend rams should be "blind" rams.

PP. 44, middle page:

(f) It must allow electric and radioactive logging . . . . . This is too strongly worded. Suggest"condition mud to obtain best logging conditions possible. . . . ." Mud cake will affect logging, yet (d) says "it must form an impermeable cake on the wall.......

PP. 60, 14th line:

"....extends to approximately 250 feet into Gulf of Mexico." We think what is meant is in water 250 feet deep.

Vol. 1 Cont'd

PP. 69, 11th line:

"...... takes between 4 and 5 years to prove......fabricate.....erect...... drill 15 development wells." This can be done in less time. Attached is an excerpt from Bureau of Mines' in-house study on time cycle for Gulf of Mexico operation.

PP. 99, 2nd line:

"......original OCS regulationd......" should read regulations.

PP. 104, 14th line:

Table needs number 3.

PP. 167, 16th line:

"....... table ___ does not...." Table needs a number.

PP. 168:

Errors in table. Rounding should not be used where the numbers are available. Three totals were rounded; one was not. Sample of corrected page attached.

PP. 170 and 171:

Last paragraph on pp. 170 talks about 1954 lease sale and on pp. 171 a $116 million figure is mentioned which is presumed to be the amount of money from 1959 lease sale. After this comment, a mention is made of 34 offshore lease sales and cash bonus system was used for all lease sales is not given. Having given 1959 sales receipts, why not give those 34 offshore totals received from all lease sales.

PP. 171, 17th line:

"Recent lease sales have been followed rapidly by actual drilling of tracts leased." Earlier in report (pp. 69) it says time lag short 4 to 5 years. Rather than say rapidly, it should be put into a timeframe to be more explicit.

PP. 182, 3rd line:

Figure number left out. Should be 5.

PP. 188, 14th line:

Figure number left out.

PP. 188, 19th line:

Written (Fig. 8 should read "(Fig. 8)."

TIME CYCLE FOR GULF OF MEXICO OPERATIONS

Figure 1 was prepared to illustrate how Gulf of Mexico leasing, exploration, development, and production operations can progress timewise. Using the time schedule shown in figure 1, a 12-well production platform can be in operation in 34 months. Under ideal conditions this time interval may be reduced to about 24 to 27 months. On the other hand, this period may extend several years. Planning and needs of an individual operator determine, to a degree, the ultimate time schedule.

After the bids are opened at a lease sale there may or may not be a delay of up to a month before exploratory drilling can be commenced. A successful bidder has up to a month to pay the remainder of the lease bonus bids (usually 80 percent of the amount bid) or forfeit the lease. A drilling permit may be obtained only after the entire bonus has been paid. Exploratory drilling generally requires 3 to 4 months. If only one drilling rig is used, usually three exploratory holes can be drilled during that period. When commercial production is found, additional exploratory wells may be needed to determine the best location for production platforms. About 34 days are required to drill either an exploratory gas well or a development gas completion; and about 25 days are required to drill either an exploratory oil well or a development oil completion. The difference in days required for oil and gas wells is related to their average depths. The average depth of an oil well is 10,000 feet and the average depth for a gas well is 13,000 feet.

Hydrocarbon potential evaluation followed by platform design, construction, and installation requires from 12 to 24 months. Factors that affect the time required to build a platform are overall demand, size and weather.

Pipeline design is usually possible after the general exploratory drilling program is completed, but development drilling cannot be commenced until the platform is installed. If underwater or single-well-caisson completions are used, development drilling may proceed after exploratory drilling evaluations. Development drilling and pipeline construction requires 14 to 20 months. Installation (including design changes) of production equipment requires from 1 to 3 months.

An important observation to make is that rapid hydrocarbon development is not possible in offshore operations. Even in times of urgent need, a time lag of three years should be allowed to obtain results from offshore leasing.

2/ U.S. Energy Outlook. National Petroleum Council, December 1972, 381 pp.

From: U.S. Bureau of Mines Offshore Petroleum Studies - Captioned Estimated Availability of Hydrocarbons to a Water Depth of 600 Feet From the Federal Area Offshore Louisiana and Texas through 1985. December, 1973. (For U.S. Government Use Only)

	State	Federal	State	Federal	State	Federal*	State	Federal*	State	F
Conterminous states onshore	3.100	0.214	104.200	5.577	29.3	1.7	16.0 - 27.0	1.0 - 1.5	100 - 200	30 -
Alaska onshore	0.000	0.009	0.000	0.134	9.6	0.1	5.0 - 10.0	0.0	20 - 40	5 -
Total onshore	3.100	0.223	104.200	5.711	38.9	1.8	21.0 - 37.0	1.0 - 1.5	120 - 240	15 - 3
Atlantic offshore	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	2 - 4	2 - 1
Gulf of Mexico offshore	0.100	0.390	0.700	2.770	0.5	3.5	0 - 0.5	2.0 - 3.0	2 - 4	15 - 2
Pacific offshore	0.100	0.020	1.300	0.020	0.7	2.2	0 - 0.5	1.0 - 2.0	1 - 2	4 -
Alaska offshore	0.100	0.000	0.500	0.000	0.7	0.0	0 - 0.5	0.0	2 - 4	28 -
Total offshore	0.300	0.410	2.500	2.850	1.9	5.7	0 - 1.5	3.0 - 5.0	7 - 14	68 - 1
Total on- and offshore	3.400	0.633 0.630✓	105.700	2.511 8.570✓	40.8	7.5	21.0 - 38.5	4.0 - 6.5	127 - 254	73 - 1

NATURAL GAS
(Trillions of cubic feet)

Conterminous states onshore	17.700	1.001	397.400	16.870	175.7	14.1	85.0 - 164.0	7.0 - 13.0	450 - [illegible]	18 - 1
Alaska onshore	0.000	0.055	0.000	0.307	26.4	2.1	13.0 - 26.0	1.0 - 2.0	80 - 160	26 -
Total onshore	17.700	1.057	397.400	17.177	202.1	16.2	85.0 - 190.0 97.0	8.0 - 15.0	530 - 1050	75 -
Atlantic offshore	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	5 - 10	50 -
Gulf of Mexico offshore	0.600	3.030	3.900	17.400	6.5	35.8	3.0 - 5.0	18.0 - 36.0	10 - 20	150 -
Pacific offshore	0.000	0.010	1.200	0.040	0.7	2.0	0.0 - 0.5	1.0 - 2.0	5 - 10	5 -
Alaska offshore	0.100	0.000	0.600	0.000	1.8	0.0	1.0 - 1.5	0.0	20 - 40	100 -
Total offshore	0.700	3.040	5.700	17.440	9.0	38.8	4.0 - 7.0	19.0 - 38.0	40 - 80	355 -
Total on- and offshore	18.400	4.117 4.103✓	403.100	34.617✓	211.1	55.0	103.0 - 197.0	27.0 - 53.0	570 - 1140	430 -

*Distribution between State and Federal is based on assumption that reserves are in the same ratio between the two as recent production.

**As shown by the range, unit figures have little significance for individual areas, but merely show the approximate distribution of the rounded total for the United States--200-400 billion barrels of petroleum liquids and 1,000-2,000 trillion cubic feet of natural gas.

***Total U.S. measured reserves derived from American Petroleum Institute and American Gas Association.

Table should be numbered —.

Estimates revised: Feb. 14, 1974

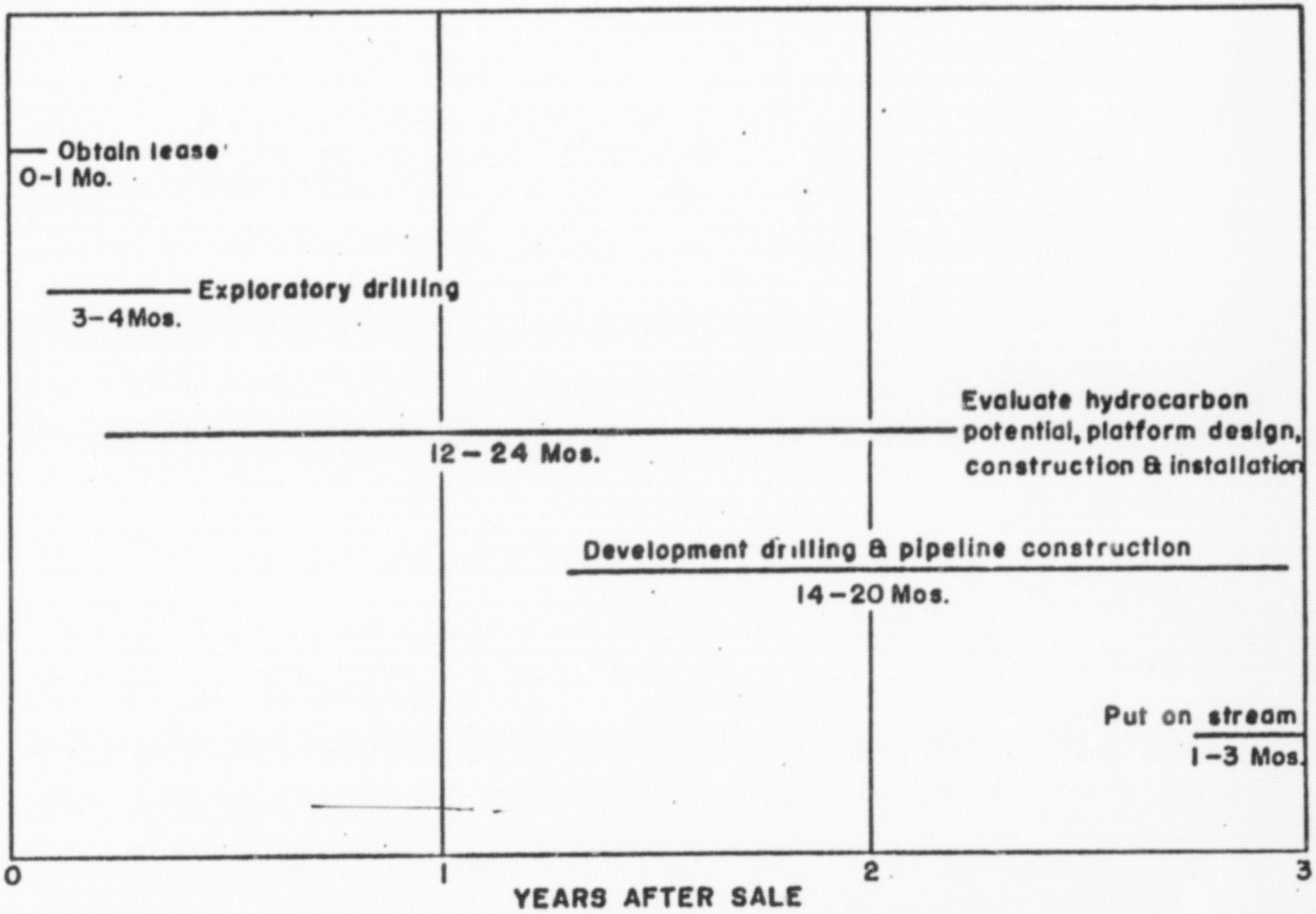

FIGURE 1. - Evaluation and development time profile for Gulf of Mexico operations to a 600-foot water depth.

Vol. 1, Cont'd.

PP. 199:

Drawing listed as Fig. 4 should be Fig. 14.

PP. 219, last paragraph:

Temperature on pages 207-208 and 209 is given in Fahrenheit (F). Suggest all measurements be given in English system with metric numbers in brackets.

PP. 223, 5th line:

.......increasing offshore to 36 ppt..... API standard for reporting salinity is parts per million (ppm).

PP. 240, 11th line:

Last word of sentence, through, seems unnecessary.

PP. 305 and 307:

No mention of Figure 37 in text.

PP. 309, 13th line:

No table number; should be table 15.

PP. 309, 15th line:

Table 15 should be table 16.

PP. 345, 4th line:

Table not numbered. Probably 19.

PP. 358:

Figure 50 is mentioned but no mnetion is made of the a, b, c, or d sections of table 50.

PP. 361, 1st line:

here give measurements in feet and meters which should be done throughout the report.

PP. 366:

No mention is made of figure 52 in text.

PP. 386, 2nd line:

".....Continental Shelf but rath as a ....." Should be "rather."

Vol. 1, Cont'd.

PP. 397, 21st line:

In discussion only mentioned Fig. 69. No mention of 69a and 69b. These should be listed as different figures instead of a and b.

PP. 401, 20th line:

Refer to Mercalli scale. This term is not familiar. It seems that all reporting is in Richter Scale and its meaning is generally understood.

PP. 417, 19th line:

...... salinities of the Pacific Offshore range from about 33°/00 to 34°/00.... On pp. 223 salinity is reported as ppt. The methods of reporting salinities are not consistent; suggest standardize on API which says parts per million (ppm).

PP. 458, 3rd line:

Written material calls for Fig. 79; however, Figure 79 is in two parts. These figures are so different, they should not be considered as a and b, but have separate numbers.

PP. 463, 10th and 12th lines:

Spelling Richter or Rickter. On pp. 401 using Mercalli scale. Should be consistent; suggest use Richter which is in more common use.

PP. 473, 11th and 16th lines:

Discuss Figures 85a and 85b. As these figures are so different, they should have separate numbers.

PP. 475, 6th line:

Says table 72..... as this is the first time table 72 is referred to, it should be on the following page. Found table 72 in volume 2, pp. 139. Suggest table be put where first mentioned and repeated in volume 2, if necessary.

PP. 479, 10th & 22nd line:

Refers to Figures 87a and 87b. These figures are so different they should have separate numbers.

PP. 482, 2nd line:

Again refers to table 72 which is located in second volume, pp. 139. At least if referring to this, give volume and page numbers where it can be located.

Vol. 1, Cont'd.

PP. 487, 17th line:

Again, it refers to table 72. Same comment as before.

PP. 494, 18th line:

Again reference is made to table 72. Comment same as before.

PP. 501, 7th line:

Table 24 is misnumbered. Table 22 on pp. 455. Table on 501 is the next table, therefore, should be table 23. All the tables that follow have incorrect numbers.

PP. 503, 4th and other lines:

Gives wind speed in miles per hour (MPH). In other discussions reference is made to wind speed in knots. The latter, knots, is the common unit of measurement for wind speed. Standardize and use only one unit of measurement for the entire report.

PP. 504, 21st line:

Written as Figure 18. Checked Figure 18 on pp. 218 and found caption to be "Geographic Location Map of Southern Portion of Gulf of Mexico." This should be Figure 98.

PP. 510, 13th line:

"Figure 99 and ____ shows average ...." Figure number left out.

PP. 513:

No mention of Figure 100, pp. 512. Suspect it should follow Figure 99 (see comment for page 510).

PP. 518, 2nd line:

Salinity reported as $32.7^{o}/00$ which is not considered as standard. As discussed previously it should be ppm.

PP. 561, 15th line:

Salinity reported as 25 and $32^{o}/00$. Not considered as standard.

PP. 570, 11th line:

Salinity reported as $1\text{-}28^{o}/00$. Same comment as before.

Vol. 1, Cont'd.

PP. 580, 8th line:

NAR Area 5. This and all like plats (pages 581 through 615) should have a figure number. This will change the number of all figures that follow.

PP. 587, 7th line:

Percent ownership (less than 74% + 21% + 3%) adds up to less than 98%. Should correct to 100% or explain the 2% difference.

PP. 590, 2nd line:

Table number left out. Should be 32.

PP. 609, Table 36:

Percent distribution - area 18, adds up to 92 instead of 100 and area 20 adds up to 97 instead of 100.

PP. 617:
The county listings should be given a table number. This will change the number of all tables that follow.

PP. 619:

The text should state that the geographical location of the numbered sector can be located on Figure 109.

PP. 620, 22nd line:

Written "...... with as much as 50% of their land in wetlands and 79% in commercial forest areas." This gives 129%. If figures are correct, needs an explanation as to why more than 100%.

PP. 623, 5th line:

Written "..... more than 83% of its land area forested and 14% of its land in farms." Needs explanation as to what happened to the 3% remaining.

PP. 623, 18th line:

Written "..... only 50% covered with forest areas; 11.7% of its lands are in farms. Need explanation as to what is the rest of the land use in order to bring the total up to 100%.

PP. 631, 9th and 11th line:

The three percentages for sector 10 do not add up to 100%. Needs correction or explanation.

Vol. 1, Cont'd.

PP. 635, 2nd line:

Table should be given a number. Find no mention of table numbers in this portion of the text.

PP. 640:

Find no mention in text of tables 39, 40, and 41.

PP. 653, 17th line:

Word "iar" probably should be "air."

PP. 657, 12th line:

"Waterqay"should be "waterway."

PP. 676:

Tables 42 and 43 not mentioned in text.

PP. 678:

Table 44 not mentioned in text.

PP. 679, 8th line:

Table not numbered in text.

PP. 685:

Tables 46 and 47 not mentioned in text.

PP. 701, 1st and 5th lines:

Figure numbers left out.

PP. 705:

Table 49 not mentioned in text.

PP. 709, 14th line:

Salinity reported as ppt. Use standard reporting as ppm.

PP. 723, 6th, 10th and 15th lines:

Salinity reported as $0.4_0/00$. Not API standard. Use ppm.

Vol. 1, Cont'd.

PP. 723:

Figure 113 not mentioned in text.

PP. 724, 1st line:

Salinity not reported as ppm.

PP. 724, 7th line:

Written "..... oyster reef is diagrammed in Figure _?_. Do not find such a diagram.

PP. 726:

No mention of table 52 in text.

PP. 749, 750, 751, 752:

No mention of these figures in the text.

PP. 759, 7th line:

Written as ". ..... table 55." This figure (No. 55) is on pp. 373 and is captioned "Generalized map showing relative amounts of landslides in California." Need to change table number from 55 to correct number.

PP. 764:

No mention of tables 56, 57, 58, 59, and 60 in text.

PP. 765:

No mention of table 61 in text.

PP. 767, 5th line:

Table needs number.

PP. 778, 8th line:

Table needs number.

PP. 779:

No mention is made of table 64 in text.

Comments on Draft Environmental Statement
Vol. 2 of 2. DES 74-90

PP. 36, 18th line:

Table should be numbered.

PP . 37:

Table should have a number.

PP. 39, 1st line:

"The unusually heave ....." spelling "heavy."

PP. 44, 6th line:

Need to refer information on Washington State Parks as table __.

PP. 45, top of page:

Table should have number.

PP.46,bottom of page:

Census growth should be referred to as table __.

PP. 49 , 15th line:

Imports + Exports + Domestic = 21,836,690, not 23,836,690 as written.

PP. 50:

Would consider the tabular material as a table.

PP. 51:

Give tonnage data a table number.

PP. 55:

(4) Commercial Fisheries, pages 55, 56, 57, 58, and 59 are identical to the data on pages 13, 14, 15, 16, and 17. Why repeat this information.

PP. 60 and 61, 5th line:

Tables A, B, C, D, and E are on these pages. To be consistent in the reports, these tables should have numbers.

PP. 66, 12th line:

Wrong table number. Figure 11 is in Vol. 1, pp. 194, and captioned "Seismic Risk Map for Counterminous United States." This needs to be corrected.

Vol. 2, Cont'd.

PP. 67, 10th line:

Figure 11 mentioned again. Wrong number.

PP. 106:

These two tabulations should be called tables and given a number.

PP. 113:

Figure 120, Map of Alaska. Numerals refer to regions described in Table 1. Table 1 is in Vol.1, pp. 45, and is "Mud components used in seawater....." This table number is not correct.

PP. 133, 15th line:

"Lincensed" spelling "licensed."

PP. 140:

Suggest tables 75a and 75b be given separate numbers.

PP. 144, bottom of page:

Talk about tables and figures but do not give any number. Suggest using the numbers in the written part of the report.

PP. 161, 2nd line:

"....dumpted..." spelling"dumped."

PP . 164, 14th line:

What is ppb? Why not use parts per million (ppm)?

PP. 165, 13th line:

Used ppm here. On pp. 164 used ppb as the unit of measure. Be consistent.

PP. 170, 17th line:

Used ppt. In the report, ppt, ppm, and ppb have been used as the units of measure. Suggest that one be used as standard; preferably parts per million (ppm).

PP. 173, 5th line:

"..... quicly...." spelling "quickly."

PP. 220, last line:

Table needs number.

Vol. 2 Cont'd.

PP. 224, bottom of page:

Table needs number.

PP. 235, 6th line:

Needs figure and number (Fig. 129) for map discussed in write-up.

PP. 239, 1st line:

This should be Lake Charles instead of St. Charles.

PP. 255, 16th line:

Period at end of sentence.

PP. 314, 6th line:

".....bery" spelling "very."

PP. 325, 1st line:

Suggest using "Department of the Interior."

PP. 328, 22nd line:

"A total of 63 responses were received (see attachment G)." Attachment G in the back of Vol. 2 is a series of maps with no comment. Attachment E is the "Report of responses received." Tables 1 through 4 are the summation of the order of preference; therefore, should change attachment G to attachment E.

PP . 338 , 12th line:

".....co ld"spelling "could."

PP. 341, 21st line:

"43 U.S.C. § 1334 (a)(1)." Should be bracketed and drop period after "mind."

PP. 351:

Should have figure and number after PAD I to advise reader of plat on pp. 352.

Vol. 2 Cont'd.

PP. 352:

Map should have figure number and should be mentioned in text. (See comment for pp. 351.)

PP. 354:

Case I, year 1975 does not add up to 17.9 but to 17.37.

PP. 359:

Table should have a figure number and should be referred to in the text on pp. 358.

PP. 360:

See comment on pp. 359, above.

PP. 361:

See comment on pp. 359, above.

PP. 362:

See comment on pp. 359, above.

PP . 363:

See comment on pp. 359, above.

PP. 367, 9th line:

Table needs number.

PP. 368 and 369:

Tables need number.

PP. 371, 8th line:

Table needs number.

PP. 372:

Table needs number.

PP. 373:

Called table 1 which is incorrect. Also need table number in text.

PP. 374:

Needs table number and put number in text. Table is not clear. Example: opposite Georgia, why two sets of numbers? How do you get subtotals, new plants, and plant additions.

Vol. 2 Cont'd.

PP. 375:

Same comment as pp. 374.

PP. 376, 5th line:

Needs table number.

PP. 377:

Table needs number.

PP. 392:

Table needs number and should be mentioned in text.

PP. 395, 6th line:

Shemes, spelling error.

PP. 396:

Needs table number and discussion of table in text.

PP. 398, 20th line:

Needs table number.

PP. 399:

Needs table number.

PP. 403:

Needs table number in text and table.

PP. 405:

Need table number in text and table.

PP. 406:

Needs table number.

PP. 407, 22nd line:

Needs table number.

PP. 408:

Table needs number

PP. 418, 8th line:

"....- beacuse; spelling error.

Vol. 2, Cont'd.

PP. 424:

In written material say that Title 30 CFR Chapter 11, paragraph 250 can be found in Attachment A (following pp. 466). Also, should state that special orders in Attachment B.

Last 7 pages of Part 2 are called VIII appendix...in index called Attachment I. Should be consistent with index and follow scheme used for all other attachments.

Bureau of Mines (BOM)

The Bureau of Mines submitted extensive comments, mostly of a useful editorial nature. In nearly all cases, the editorial (typographical errors, misspellings, mislabeling of tables and figures) changes have been made. In a few cases, sections have been deleted from the text, obviating such changes. Editorial changes are noted in our responses simply as "Editorial"; other issues are addressed individually. The format followed is the same as that used by BOM, i.e. referencing page numbers of the EIS.

Disposition

General Observations

1. The English system has been applied more consistently throughout the final EIS; however, metric equivalents are not given. In some cases, the metric value has generally recognized meaning (such as 200 meters as a general depth of the shelf-slope break); these have been retained).
2. Figure and table numbers have been completely redone.
3. Contrary to the API standard, the oceanographic science community still uses the parts per thousand (= ppt, = $^{o}/oo$) measure.

Specific Comments - Volume 1

Page 25 - This was a NOAA recommendation that has not been accepted by the BLM or USGS, primarily for the reasons outlined in the BOM comment.

Page 35 - Editorial

Page 44 - Suggested wording has been incorporated.

Page 60 - Water depth was intended.

Page 69 - The statement has been revised to reflect BOM estimates of 3 to 5 years.

Pages 99, 104, 167, 168 - Editorial

Pages 170-171 - Lease sale bonuses through Sale #37 total $15.1 billion. This figure has been added to the discussion. Exploratory drilling can begin rapidly, but full production would still take 3-5 years.

Pages 182, 188, 199, 219, 223, 240, 305, 309, 309, 345, 358, 361, 366, 386, 397, 401 - Editorial

Page 417 - °/oo is the same as ppt --- standard for oceanographers.

Pages 458, 563, 573, 475, 479, 482, 487, 494, 501, 503, 504, 510, 513, 518, 561, 570, 586, 587, 590, 609, 617, 619, 620, 623, 631, 635, 640, 653, 657, 676, 678, 679, 685, 701, 705, 709, 723, 724, 726, 749-752, 759, 764, 765, 767, 778, 779 - Editorial

Volume 2

Pages 36, 37, 39, 44, 45, 46, 49 51, 55, 60, 61, 66, 67, 106, 113, 133, 140, 144, 161 - Editorial

Page 164 - Because ppb avoids the use of a decimal point. The unit ppb is well enough understood (= parts per billion).

Pages 165, 170, 173 220, 224, 235, 239, 255, 314, 325, 328, 341, 351, 352, 354, 359, 360-363, 367-369, 371-373 - Editorial

Page 374 - The Federal Power Commission is cited as the source for this material.

Page 375-377, 392, 395, 396, 398, 399, 403, 405-408, 418, 424 - Editorial.

In general, most of the editorial comments refer to table and figure numbering. In many cases, tables and figures were not numbered where they were illustrating one specific point in the text. However, in the final EIS, all figures and tables will be numbered, and care will be taken to identify them within the text.

United States Department of the Interior

BUREAU OF OUTDOOR RECREATION
WASHINGTON, D.C. 20240

IN REPLY REFER TO:

DES-74/90

DEC 30 1974

Memorandum

To: Director, Bureau of Land Management

From: Acting Assistant Director, Bureau of Outdoor Recreation

Subject: Draft Environmental Impact Statement Concerning the Proposal to Increase Outer Continental Shelf (OCS) Oil and Gas Leasing to Ten Million Acres in 1975

This is in response to your request for our comments on the subject statement.

The draft statement is of a programmatic nature; it is not site specific. As such, we believe it does a fine job of recognizing our valuable seashore and marine recreation resources and presents a wealth of information in a fairly readable form. It also recognizes the potential adverse impacts of major oil spills and related accidents upon recreation resources, along with a good discussion of the state-of-the-art of preventive and containment measures for such spills.

We feel that exploratory drilling and the construction of drilling platforms may have a lesser impact upon recreation than the ancillary activities such as the transportation and processing of oil and gas and suggest that the final statement include a thorough discussion of these latter activities and their probable impacts upon recreation.

Specific Comments

Volume 1 page 746 - The following modifications to Table 52, should be made:

State Parks

Texas

1. Texas State Park in Jefferson County (proposed) should be changed to Sea Rim State Park.

9. Mustang Island State Park (proposed) "proposed" should be deleted.

Louisiana

Add: Iles Dernieres State Park (proposed)
Chenierre-Au-Tigre State Park (proposed)

Volime 2, page 37 - A graphic presentation of this tabular data showing the geographic relationship between these areas and possible OCS lease sites, transportation routes, or refining sites would be helpful. This comment is also germane for similar information about Washington and Alaska.

Volume 2, page 45 - The Recreation Resources section about Washington State is deficient in its consideration of the recreational resources of Puget Sound. Although the Sound will not be the location of any leases, it may well be a major terminal for Alaskan and Northwest OCS oil and gas.

Volume 2, page 123 - The section discussing Recreation Resources of Alaska should be expanded to highlight the great potential for recreation and tourism which has not been developed. Attention should be given to the expanding Japanese and lower 48 tourism market and its potential place within the State's economy.

Volume 2, pages 212-214 - The report alludes to potential environmental impacts on recreation resources (beaches, boating facilities, etc.) in general terms, yet the cost of clean-up operations, cost of restoration of resources, and the economic loss to the recreation economy in the event of large spills or blow-ups is not discussed in detail.

Volume 2, page 219 - The sections dealing with Land Use and Socio-Economic Effects on Onshore Development should be expanded to more fully consider the effects of increased population and the corollary increased demand for outdoor recreation facilities. On the bottom of page 219 on to 220, it is stated that OCS oil and gas induced growth " . . . will strain existing public services . . . " If possible, the "strain" on recreational facilities should be quantified.

Volume 2, page 232, para. 2 - The difficulty noted by Resource Planning Associates, Inc. (RPA) in finding "enough land in the San Francisco Bay and Puget Sound regions for base case and OCS-induced growth" should be quantified or narratively expanded upon. A similar more specific description of the difficulty foreseen in "some of the potential Alaska staging areas" would be helpful. The relationship of these needs to the recreation needs identified in the State Comprehensive Outdoor Recreation Plans should be identified.

Volume 2, page 255, para. 1 - Where a buried pipeline crosses sandy beaches, trenching and backfilling will leave a very short term disturbance; however, much of the coastline of the Northwest and Alaska is made up of headlands. Recognition should be given to the greater difficulty and the more lasting impacts of bringing pipelines onto shore types other than sandy beaches.

Volume 2, page 256, para. 2 - The exclusion of Washington and Oregon from the listing of States with "high" use and value sandy beaches is not accurate. Many of the coastal counties of these two States rely heavily on income generated by users of coastal recreation resources including the sandy beaches.

We appreciate the opportunity to review and comment on this draft statement.

Bureau of Outdoor Recreation (BOR)

The Bureau of Outdoor Recreation presented comments on the draft EIS that were commendatory regarding the general presentation of recreation resources in such a programmatic statement, and suggestive of further refinements and information presentation.

Disposition

Volume 1

Page 746 - The modifications to the listing of State Parks have been made.

Volume 2

Page 37 - Graphical presentation of Federal and State parks and refuges has been provided.

Page 45 - The discussion of Puget Sound has been expanded.

Page 123 - The potential for expanded tourism in Alaska has been recognized in the final EIS; however, no quantification of this potential was possible.

Pages 212-214 - The example provided by the Santa Barbara blowout in terms of resource loss, cost of cleanup, etc., is presented in Section III on Impacts on the final EIS.

Page 219 - The effects of increased population and "strain" are treated generally in the final EIS. Quantification, where possible, will be treated in site-specific statements; a program overview EIS can not begin to treat these factors for all the coastal states.

Page 232 - Again, a large amount of detail is called for in this comment by BOR. The problem of discriminating "base case" from OCS induced growth is discussed in both generic onshore impacts and in the effects on refinery siting and future capabilities.

Page 255 - The greater difficulty and longer lasting impacts of pipelines crossing rocky shorelines have been addressed in Sections II and III. There is little, if any experience in the U.S. with this type of operation bringing OCS oil and gas onshore. It seems likely that where the coastline is hostle or where States require burial in rocky substrate, industry would elect to find an alternate landfall on a sandy beach, mudflat, or marshland. Presumably, a State could prohibit pipelines from crossing rocky headlands.

United States Department of the Interior

NATIONAL PARK SERVICE
WASHINGTON, D.C. 20240

IN REPLY REFER TO:
L7619-MQ

JAN 2 1975

Memorandum

To: Director, Bureau of Land Management

Through: Assistant Secretary for Fish and Wildlife and Parks [illegible] RR 1/6

From: Acting Associate Director, Park System Management

Subject: Draft Environmental Impact Statement Concerning the Proposal to Increase Outer Continental Shelf (OCS) Oil and Gas Leasing to Ten Million Acres in 1975 (DES 74-90)

As requested in your memorandum of October 25, 1974, we have reviewed the subject statement and offer the following comments.

COMMENTS ON THE PROPOSAL

The proposed action will not adversely affect any existing or proposed units of the National Park System or any existing, proposed or known potential sites or properties listed or to be listed as National Landmarks.

COMMENTS ON THE ENVIRONMENTAL STATEMENT

We agree that impacts on historical and archeological resources could stem from two sources: oil spills, and pipeline burial operations or construction of terminal, storage, or pumping facilities. The normal pipeline route survey procedures which usually include a magnetometer survey could be augmented with side-scan sonar surveys. Such surveys have been used in the past in deeper waters to determine the presence or absence of sunken vessels or other historical and archeological resources.

In shallower waters, divers have been used to inspect the pipeline routes for cultural resources. These methods of underwater investigation could be very important because sea levels have fluctuated through time and have at times been lower than they are at present.

CONSERVE AMERICA'S ENERGY

Save Energy and You Serve America!

We are pleased that special surveys of onshore facility site locations and pipeline routes will be conducted by competent, professional archeologists and should be made early enough in the planning stages of the individual projects that the results of the surveys can be incorporated into the decisionmaking process for selecting the best alternative and in developing final designs for the projects. In this way, if sites with National Register potential are identified in the development area would be appropriate to avoid damaging such sites could be employed.

We recommend that a more detailed set of guidelines and procedures to protect archeological and historical resources be developed and included in the final statement to help assure agency compliance with Federal legislation and regulations, particularly Title 36 CFR 800.

These mitigative measures should recognize the need for monitoring by professional archeologists of any borings, excavations, or trenches in areas where the potential for uncovering buried cultural resources is high. A professional archeologist familiar with the situation in the particular project area should be consulted in regards to whether or not such monitoring would be appropriate.

Another procedure which aids in the protection of cultural resources is consultation with the State Historic Preservation Officer regarding properties listed on or in the process of nomination to the National Register of Historic Places. This does not provide assurance that no archeological resources exist in the project area, only that none have yet been nominated to the Register.

Gerald D. Patten

National Park Service (NPS)

The National Park Service submitted comments generally related to the possible degradation of undiscovered cultural and archeological resources on the seafloor.

Disposition

Identification of cultural and archeological resources on the seafloor before possible destruction by platform or pipeline siting has been the goal of a developing program between BLM and NPS. After a long period of development and coordination between BLM and NPS, a special stipulation has been finalized that will in most cases be applied to all future lease sales. It stipulates certain procedures and pre-drilling and/or pre-pipelaying surveys that must be performed before submission of development plans. It also provides for regional identification of areas likely to contain such resources. The stipulation is written such that it maintains the flexibility to be applied in all areas as appropriate.

United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VIRGINIA 22092

OFFICE OF THE DIRECTOR

DES 74-90

JAN 3 1975

Memorandum

To: Director, Bureau of Land Management

Through: Deputy Assistant Secretary—Energy and Minerals

JAN 8

From: Director, Geological Survey

Subject: Review of draft environmental statement concerning the Proposal to Increase Outer Continental Shelf (OCS) Oil and Gas Leasing to Ten Million Acres in 1975

We have reviewed the subject document as requested in your memorandum of October 25, 1974. Our specific comments are attached hereto.

Henry W. Coulter
Acting Director

Attachment

Specific Comments on

Draft Environmental Impact Statement
Proposed to Increase Outer Continental Shelf (OCS)
Oil and Gas Leasing to Ten Million Acres in 1975
DES 74-90

Volume 1

Page 6, paragraph 2: The Nation's entire supply of domestic OCS oil and gas does not come from the Gulf of Mexico. There is OCS production of oil and gas in the Santa Barbara Channel, offshore California.

Page 7, paragraph 2, last sentence: Drilling on Federal lands in southern California has not been suspended since 1969. Drilling on OCS lands in the Santa Barbara Channel, although somewhat restricted, has been carried on almost continuously since that time.

Page 8, paragraph 1: Line 5 should read, "Operating orders, similar to those used in the Gulf of Mexico and California . . ."

Page 9, line 14: Leases have previously been sold offshore Florida (1959) and three wells were drilled in the early 1960's. Therefore, there is a history, although quite limited, of OCS operations in this area. Change "operations" to "production."

Page 9, line 15: It is unclear what "that proposal" refers to. Perhaps it should read, "the frontier leasing proposal."

Page 10, paragraph 2, last line: The attachment reference is missing.

Page 11, paragraph 2, lines 4-6: This sentence is incorrect. What is "geotechnical information"?

Pages 12-13, paragraphs 2 and 1, respectively: These paragraphs should be rewritten to more clearly define the role of the USGS in OCS operations.

Page 13; Paragraph 2:should read, "benefits accrue from development through jobs and services and through oil revenue; either indirectly through taxes and royalty payments or directly as in the case of the City of Long Beach, California."

Page 14: Although it has been mentioned that the scope of this statement was not intended to cover specific areal impacts on tracts to be offered for leasing, but that this would be covered by future environmental statements, it might be advisable to mention it at the outset, such as in a footnote on the Summary page.

Page 18, last line: Give attachment number or letter.

Page 21: Paragraph 3 should be "58 billion," not "50."

Page 22, lines 2-4: It is stated that a Bureau of Mines analysis of supply and demand of petroleum until 1980 "predicted that the demand for oil in 1980 will be 20.8 million barrels per day and for gas 34.5 trillion cubic feet per day." Essentially the same statement is also included in Attachment H (v. 2, Attachment H, p. 24, lines 6-8). We suspect that the prediction of gas demand may have been intended to be 34.5 trillion cubic feet per year. One source gives 1980 demand for gas as 35 trillion cubic feet per year (R. B. Foster, 1974, Future availability and prices of industrial fuels, from Proceedings of a Symposium on Efficient Use of Fuels in Processing and Manufacturing Industries: Manufacturing Industries' Institute of Gas Technology). It might be advisable to check other figures in the same section of the environmental statement for accuracy. For example, 1980 supply is estimated to be 11.7 million barrels per day and 20.4 trillion cubic feet per day (p. 22, lines 4-5). Again the figure for gas appears to be suspect, since current supply appears to be roughly 23 trillion cubic feet per year, according to the Natural Gas Supply Committee.

Page 22, paragraph 1: Perhaps the following should read, "In the present day tight domestic supply situation . . ." The text is referring here to supply and not to resources or reserves.

Page 24, paragraph 3, item 1: Explanation should be added as to why platforms should not be in coral reef areas. If considered from the standpoint of fish life only the platform may enhance it.

Page 26, paragraph 2: What do they dump?

Page 26, paragraph 3: We question if Alaska would be the most economical of frontier offshore areas to be developed.

Page 28, paragraph 2, line 2: BLM and USGS field offices select the final tracts, not just BLM.

Page 28, paragraph 2: Line 9 should read, "(2) leasing in a manner which will ensure full development of hydrocarbon resources. . ."

Page 28, last paragraph, line 1: USGS must insure that operating orders have been developed, not BLM and USGS.

Page 30, first two sentences: Other energy sources were developed before 1968. Sparker patented before 1953. Omit "Since then."

Page 30, paragraph 2, line 5: Omit "beamed to" and insert "filtered."

Page 34: It is implied that the riser is attached to the drive pipe before the BOP stack is installed. When a floating vessel is used for offshore drilling, the BOP stack is installed on the ocean floor and the riser is connected to the BOP stack.

Page 34, paragraph 2: Drive pipe is driven to a minimum of 100 feet, not "as much as 100 feet."

Page 35: The BOP stack is never located on top of the drilling riser. When drilling is done from a fixed structure or jack-up, the BOP stack is attached to the top of the structural casing, just under the drilling floor. Drilling risers are not used during drilling from a fixed structure. When risers are used, the BOP stack is always set on the ocean floor.

Page 35, line 2: "Blind rams" should be substituted for "blend."

Page 37, last paragraph, line 2: Omit "water surface-piercing."

Page 38: Paragraph 3 appears to repeat generally what was said in paragraph 3, page 36.

Page 42: Paragraph 2 should read, ". . . the casing and mud program, formation penetration, expected geologic hazards, bottom hole location, etc., for each development well must be approved . . ."

Page 48, paragraph 2: In the first sentence the information in parenthesis should be "(900 feet of 20-inch and 3,500 feet of 16-inch)."

Page 54, line 1: "Prohibit" should be changed to "restrict" and ". . . under certain conditions" should be added to the end of the sentence. The last sentence of the first paragraph should be deleted as revised OCS Order No. 8 is not yet in effect.

Page 70: Plugging on well abandonment is mentioned. We suggest mention of the need for special precaution, which appears to have been taken for granted in the preparation of the statement. Plugging of non-productive test holes as well as that of abandoned producers should include thorough and permanent sealing through all formations that are fresh-water aquifers either at the sites of the drillholes or in related onshore areas. If any drillhole is left open or inadequately plugged through fresh-water aquifers or through their offshore extensions (which may locally contain brackish or saline water), a continuous and progressive loss of artesian pressure could occur that ultimately could have adverse effects on the onshore fresh-water resources.

Page 70; Paragraph 2 should read, "Unstable bottoms may require additional study by both industry and government before drilling operations are allowed to proceed."

Page 72, paragraph 3: A permit has been issued to the 850-foot platform.

Page 74, paragraph 2: New completions are required to use surface activated subsurface safety valves if the shut-in tubing pressure is less than 4,000 psig. If the SITP exceeds 4,000 psig, either a surface or subsurface activated subsurface safety valve may be used.

Pages 78-79: In section (7) the limitations of oil spill containment and clean-up are described. Although clean-up systems are still restricted by sea conditions, there has been considerable improvement in spill control systems. For example, the Vikoma Seapack containment system has demonstrated its effectiveness in up to 8-foot waves and both short and long seas. The accompanying skimmer is quite stable and has been shown to be efficient in dealing with oil slicks in 6-foot waves. This type of skimmer utilizes oil pickup discs with water-shedding properties which limit the water pick-up to less than 2 percent, even under adverse conditions.

Page 79: The table number (1) is omitted from the paragraph, near the center of the page, concerning drilling waste disposal.

Page 81: Practical use of an "Omnidirectional Drilling System" is too far into the future to be realistically discussed as a drilling alternative in this text.

Page 81: In the quotation in the middle of the page, "Curvilinear" is misspelled as "Curvilineas." It is suggested that "[sic]" be inserted in this quotation after the misspelling.

Page 90, last two paragraphs: The ROV program has been run by USGS for Gulf of Mexico sales but not necessarily so for the frontier areas. Also, it is not clear if BLM directs GS to use certain values for the price of oil, gas, and discount rate.

Page 92, paragraph 2: The first sentence should read, "In the OCS sale held on October 16, 1974 . . ."

Page 92, paragraph 2, last sentence: We suggest deleting the last sentence and replacing it with, "The impact of royalty bidding and sale of royalty tracts on the exploration and development of offshore leases will not be known for some time. However, an analysis of the bidding on Sale #36 is included on page 12 of this report."

Page 96, paragraph 2: Line 4 should read, ". . . approved by the U. S. Geological Survey (USGS) through the Oil and Gas Supervisor before . . ."

Page 99, OCS Orders: Formal draft operating orders for Alaskan operations have not been developed and reviewed by industry. Formal draft orders have not yet been published for comment in the *Federal Register*.

Page 102, lines 6 and 7: The number of minor platforms inspected should be 991 instead of 801, and the period discussed should be through January 31, 1974, instead of September 30, 1973.

Page 110, lines 1-2: This has never been necessary in the case of any oil spill from OCS lands. Also, the plan has been in effect for several years (1969-70?), not just since 1973. It was last revised completely in 1973.

Page 111, lines 4 and 5 from bottom: The plan is operative nationwide, not just in the Gulf of Mexico.

Page 113: The last sentence is unclear; we do not believe Federal approval is necessary for such groups.

Page 127, paragraph 3: It is stated that the findings of the CEQ report released in April 1974 included a ranking of several prospective areas on the basis of hydrocarbon potential and environmental considerations, and that "the highest environmental risk of development was assigned to the Northern Baltimore Canyon, Southeast Georgia Embayment, and Gulf of Alaska." Although it is not specifically stated that these are listed in order of risk, this might be inferred from the reference to "ranking" that immediately preceeds the list. However, the list appears to be arranged in reverse order (i.e., in order of increasing risk), as evidenced by a comparison with more detailed rankings reported in Attachment H (v. 2, Attachment H, p. 10, Table 4). It would be advisable either to arrange the list in order of decreasing risk or to state that it is in reverse order.

Page 127, paragraph 3: The statement that the Gulf of Alaska is among the areas of high environmental risk contradicts the statement on page 26, paragraph 3, regarding the most economical area to develop.

Page 136: Supplement No. 2 to the Report of the Work Group has now been issued.

Page 144, paragraph 1: Including aid to underdeveloped nations under the heading "Domestic Need for Energy" is stretching economic theory somewhat.

Page 162, paragraph 1: See the final EIS for development of geothermal resources (v. I, p. II-10, 1973). This paragraph should be rewritten according to information contained therein.

Page 166, paragraph 1: With reference to "where not a single hole has been drilled. . ." core holes have been drilled off Georgia and Florida, and the Canadian waters of the Atlantic also have been tested by drilling.

Page 171: The last sentence on this page should read, "In 1973, oil and condensate production averaged . . ."

Page 172: This contradicts page 6, paragraph 2.

Page 173, paragraph 1: "Appalachian Piedmont Plateau" should read "The Piedmont."

Page 175: The duration of the Cenozoic is considered to be a bit longer than indicated here, about 70 million years. Accuracy in measuring geologic time does not warrant a figure of 63.011 million years. The Pleistocene Epoch began approximately one million years ago, not two million. Its duration was one million years, not two million.

Page 176, paragraph 3: The terms "basement" and "economic basement" are poorly defined. There are several possible definitions of "basement": (1) the surface beneath which sedimentary rocks are not found; (2) a highly folded complex, usually with igneous and metamorphic rocks together with some highly deformed sedimentary rocks, overlain by a sequence of younger undeformed sedimentary rocks; or (3) a complex of undifferentiated rocks which underlie the oldest identifiable rocks in the area. The term "economic basement" refers to the surface below which there is no current exploration interest, even though some sedimentary units may lie deeper. As economic conditions change, and as technology improves, the deeper rocks may become economically prospective, and the economic basement is thus redefined.

Page 177, paragraph 2: The basement on the Atlantic OCS is generally considered to be pre-Jurassic.

Page 181, paragraph 2: Only fine-grained limestones (micrites) are considered to be source rocks. The term "carbonate" is preferable to "limestone."

Page 181, paragraph 3: Coarse-grained limestones (carbonates) act as reservoirs. "Porosity and/or permeability" should be "Porosity and permeability." The fluids can migrate into a lower level under pressure due to compaction, as well as upward due to buoyancy.

Page 182, paragraph 2: Pressure "due to the weight of overlying rock strata" is geopressure, or abnormal pressure. Normal subsurface pressures are due to the overlying column of liquid--hydrostatic pressure. This can be modified in a hydrocarbon reservoir by the density difference of the contained fluids.

Page 192, "Geologic Hazards": The possibility of encountering geopressures as well as shallow gas should be mentioned.

Page 201, "Geologic Hazards": Possibility of encountering geopressures should be mentioned.

Page 206, "Geologic Hazards": The possibilities of geopressures, hydrogen sulfide, and lost circulation zones to depths of about 3,000 feet should also be discussed.

Page 267, paragraph 1, line 2: "Province" might be substituted for "feature."

Page 272, paragraph 4, line 7: Pelletoid and oolitic sands are not the same thing; they are two different types of carbonate particles. "Carbonate sands" is a better phrase to use than "organic sands" because oolites are often considered as non-organic carbonate allochems. A suggested correction for the sentence is, "algal, pelletoid, and oolitic carbonate sands."

Page 273: The Ocalla Uplift is not designated in figure 29.

Page 274, line 13: "Formation" should be changed to "rocks."

Page 275, paragraph 1: At the end of line 3, "oil-producing" should be inserted. The phrase would then read, "a very prolific oil-producing limestone."

Page 277, paragraph 2, line 1: "Shelf" should be capitalized and an alternate location reference besides "Big Bend Area" might be used because this is not a familiar term. This is an obscure and confusing reference.

Page 278, paragraph 2: "Shallow" should be changed to "gentle." "Decleavities" should be changed to "dips."

Page 298, paragraph 1, line 1: Change "2,000" to "1,000."

Page 298, paragraph 4: The local land subsidence in Houston, referred to in lines 3-4, is due to withdrawal of ground water and does not pertain to any other area in the Gulf or to oil and gas operations.

Page 305, paragraph 2: There appear to be inconsistencies in the number of drilling platforms that are likely to result from the proposed lease sale, as reported in various parts of volume 2 of the environmental statement. The number is given here as "upwards of 500 platforms." The sum of figures for existing and frontier areas is approximately 1,000 platforms, as given on page 312 (paragraph 3). Later, it is stated that "based on past leasing and exploration experience, as many as 1600 new platforms may be required" (p. 319, paragraph 2).

Pages 306 and 316: Figures 37 and 39 contain the same information on sea temperature. We suggest figure 39 be omitted.

Page 305, figure 48: Banks should either be named, or the numbers should be omitted from the map.

Page 369, paragraph 2: This paragraph on faulting appears to deal primarily with onshore effects and identification. It should include offshore aspects of faulting as well.

Page 372, paragraph 1: "Mass Wasting" refers to onshore landslide effects alone. We suggest a sentence be added dealing with the problem [illegible] offshore environment.

Page 381, paragraph 4: Subsidence at the Wilmington Oil Field might better be included in paragraph 3, page 379.

Page 393, paragraph 3: The second sentence should read, "Offshore seeps are restricted to Southern California in the area from Point Conception . . ."

Pages 454-560: We believe the discussion of plate tectonic theory is unnecessary and should be deleted.

Page 456, figure 78: The scale is too large to be useful.

Page 473, paragraph 1: A contrast is made here between "non-marine origin" and "non-marine." Clarification is needed.

Page 676: With reference to Atlantic resource figures, the footnote explaining the difference between incremental resource figures in each frontier area and the summary resource figures given in volume 2, page 345, is not clear. Additional explanation is needed or the incremental figures require revision for the purposes of this report. This holds true for all frontier area resources figures contained in volume 2 of the report as well as those on the Atlantic.

Volume 2

Page 46, paragraph 1: The use of "As a result . . ." in line 5 in reference to the preceding sentence is unclear. No mention is given of the actual geographical location of Interstate 5. Perhaps the phrase "central urban centers" might be used. We recommend this be rewritten.

Page 61: The large amount of oil and gas production in California is dismissed with a single line at the bottom of the page while agriculture, the number one industry, is given more than three pages (p. 88-91).

Page 93, last paragraph: The first sentence indicates brine and waste waters from oil-well development are sources of oil contamination in beach areas. We are not aware of these cases and would suggest addition of a reference to the appropriate source material.

Page 94, last sentence: The sentence beginning, "A large submarine oil well operation . . ." is not entirely correct. We suggest it be rewritten in a more correct and objective form.

Page 99, paragraph 2: There were 235 oil spills; the passage should include reference to how many barrels of oil were spilled and how much was recovered.

Page 141: The production figure from Alaskan upland wells is incorrect.

Page 155, paragraph 2: What volume of oil was involved in these oil spills?

Page 156, paragraph 1, last sentence: We find it difficult to believe that the platform flares are "creating a discernible amount of degradation of the air quality." How has it been measured? What is the source of that statement?

Pages 157-212: The effects of discharges of fuel oil and other refined products from tankers are continually discussed as a means of illustrating the adverse effects of hydrocarbons on offshore ecosystems. However, the environmental effects of these spills are not indicative of those that could result from OCS operations. Refined products, such as those spilled in the Arrow, West Falmouth, and Tampico-Maru incidents contain a greater amount of soluble aromatics and are far more toxic than crude oil. OCS production would tend to limit tanker spills by reducing imports of petroleum products.

Page 169: The text suggests that BLM endorses the conclusions of Dr. James I. Jones that a single catastrophic spill could well create effects that are far beyond the natural recuperative powers of the ecosystem. We do not believe that BLM should endorse such a conclusion that cannot be firmly supported.

Page 178, paragraph 2: It should be pointed out in this paragraph that barium sulfite is quite expensive and that this compound is almost completely recovered and reused.

Page 217, "Sport Fishing": The authors are offering opinions that they admit are backed by inconclusive evidence. This passage should be more factual and objective.

Page 263, paragraph 3: Since only approximately 230 tons of mud components are used in drilling a typical 10,000-foot well and most of these components are recovered for reuse, the paragraph should be rewritten to state, "It has been estimated that 1,700 barrels of cuttings and some turbidity-producing mud components are discharged overboard during the course of drilling an average 10,000-foot well."

Page 287, paragraph 2: The effective version of OCS Order No. 11 is dated May 1, 1974. This supersedes the version dated April 5, 1972. Orders Nos. 8 and 9 are dated October 30, 1970.

Page 292, paragraph 2: The statement about OCS Order No. 8 is incorrect. The second sentence should be changed to read, "In the Gulf of Mexico OCS Order No. 8 is in the process of being revised to restrict production operations while drilling or . . ."

Page 307a, paragraph 2, line 8: The last two sentences should be deleted and replaced with ". . . is discharged at sea. Most of this discharged material is drill cuttings, mud, and fines which have passed through the shale-shaker, desander, and desilter. A typical 10,000-foot well in the Gulf of Mexico requires 230 long tons of mud components mixed with 7,000 bbls. of seawater. Of this amount, approximately 160 long tons are barite, more than 90 percent of which is recovered."

Page 309: The last sentence should read, "Additionally, there were 44 oil polluting incidents of 50 barrels or more from all operations in the Gulf from 1964 to 1974."

Page 325, paragraph 2: An inconsistency appears in the number of acres of the OCS that have been leased prior to the present proposal to lease 10 million acres in 1975. It is stated here that "only a little more than six million acres have been leased in the OCS program to date." However, it had previously been stated that 7.2 million acres of the OCS had been leased from 1954 to 1970 (p. 171, paragraph 2), and that an additional 1.9 million acres were leased in the past three years (p. 171, paragraph 3). It was also stated that "there are currently about ten million acres under active lease in the Gulf of Mexico" (v. 2, p. 157-158). Although the apparent discrepancies may result from inclusion of State lands in the latter case, from exclusion of certain leases in the former case, or from different time periods in all three cases, it would be advisable to provide an explanation of these differences.

Page 329: In the top list, item 8 should be "Middle Atlantic," not "North Atlantic."

Page 335: This is a peak production list based on the maximum resource potentials for each area. It is unlikely that the maximum estimated resources exist in any of the areas. For these maximum resources to be proved in every area would be statistically impossible. These figures are therefore deceptive and we request that they be removed from this statement to prevent misinterpretation.

Page 338: The last sentence should read, "Since 1964 only 15 spills of 1,000 bbls. or more have occurred in the Gulf of Mexico as the result of operations on more than 1,500 leases including over 12,000 wells and 2,000 platforms."

Page 412, paragraph 2: Off-structure stratigraphic testing is now an accomplished fact. The South Texas well has been completed, Mustang Island is drilling, two locations have been approved by the Secretary for the Gulf of Alaska, and proposals are pending for California and possibly Atlantic frontier OCS areas.

Pages 412-413: It should be noted that applications also have been received to conduct private off-structure drilling offshore Southern California, the Gulf of Alaska, and the Bering Sea.

Pages 416-417: Some definition of "irresponsible bidders" and "inefficient firms" should be included.

Page 417: The statement about "preventing firms from winning leases" should be deleted.

Pages 425-426: The discussion of "best available demonstrated environmental control technology" does not adequately explain the term. The discussion should be simplified for the layman.

Attachment B, page 11-1: This version of OCS Order No. 11 has been superseded by a revised version dated May 1, 1974. Also Pacific Area OCS Order No. 12 has been issued, effective December 1, 1974.

Attachment I: The tentative designation of lease sales to be held in 1975, as shown on this page, appears to be different from all three alternatives that were considered earlier (v. 2, p. 326). If the schedule presented on the last page of the impact statement is the most recent and reliable plan at the current time, it would be advisable to refer to it in the section on alternatives (for example, on p. 326 in v. 2).

United States Department of the Interior
GEOLOGICAL SURVEY
12201 SUNRISE VALLEY DRIVE
RESTON, VIRGINIA 22092

January 21, 1975

Memorandum

To: Chief, Branch of Marine Environment
Division of Marine Minerals, Bureau of Land Management

From: Conservation Division Task Force Contact
U. S. Geological Survey

Subject: Corrections on our comments of December 24, 1974, on review of draft environmental statement concerning the proposal to increase Outer Continental Shelf (OCS) oil and gas leasing to ten million acres in 1975

On the second page of our comments to you, the comment on tract selection conveys the impression the final decision is made at the field level. (Page 28, paragraph 2, line 2 of draft statement) The initial tract selection is made by BLM and USGS at the field level, then forwarded to Washington where the final tract selection is made by headquarters offices of BLM and USGS.

On the fourth page of our comments to you, the last sentence (Page 99 of draft statement) - Formal draft orders were published for comment in the Federal Register on January 6, 1975.

We regret we did not discover these inconsistencies sooner.

Conservation Division Task Force Contact
Environmental Section
U. S. Geological Survey

U.S. Geological Survey (USGS)

The Geological Survey submitted substantive comments covering a wide range of geological and geophysical technical details, management and regulation of operations, and impacts. In responding to these comments, we will follow the format that USGS used, which references pages in the DES. Where an editorial correction is suggested by USGS and accepted by us, the response will simply be "Editorial", signifying that the correction has been made. Other comments are addressed individually.

Disposition

Volume 1

Pages 6, 7, 8, 9 (line 14) - Editorial

Page 9 (line 15) - The proposal was the proposed OCS Lease Sale #32 for MAFLA.

Page 10 - Editorial

Page 11 - This sentence intended to say that, for tracts near currently producing areas, a lot of geological and geophysical information, including stratigraphic and well-log data, is already on hand. In frontier areas, nearly all this "geotechnical information" must be gathered.

Pages 12-13 - The role of USGS is spelled out more clearly in Section I.D.

Page 13 - This portion has been revised in a different manner.

Page 14 - This is a good suggestion which has been implemented.

Pages 18, 21, 22 - Editorial

Page 24 - The statement regarding platform siting on coral reefs is a NOAA recommendation. Impacts on coral reefs are discussed in other sections of the EIS, so it hardly seems necessary to enumerate in this section those impacts that most people already understand, e.g. physical siting of platform legs will damage the reef. The point about fish life enhancement raised by USGS seems a superfluous benefit, if it would occur; coral reefs hardly need enhancement of fish populations.

Page 26 (paragraph 2) - Sewage and chemicals.

Page 26 (paragraph 3) - BLM also questions whether Alaska would be economical to develop; however, this was taken from an FPC response.

Pages 28 (paragraph 2, lines 2 and 9; paragraph 3, line 1), 30 (paragraph 1 and 2), 34 (paragraph 1 and 2), 35, 37 - Editorial

Page 38 - These two paragraphs say two different things.

Page 42 - We have inserted the suggested wording by USGS, but question how USGS approves "expected geologic hazards".

Pages 48 and 54 - Editorial

Page 70 - This section on plugging and abandonment refers to no-longer producing wells. These wells have a required casing program (see Operating Orders); when casing is filled with cement (sometimes the cement must extend below the last string of casing), it forms an effective barrier to fresh water release.

Pages 70 (paragraph 2), 72, 74, 78-79, 79 - Editorial

Page 81 - Editorial

Page 90 - It is true that ROV has only been run for Gulf of Mexico sales. The usefulness of this technique will probably dictate its use in frontier area sales. Also, it is more appropriate to say that BLM coordinates with USGS on values to be assigned. These changes have been made in the text.

Page 92 (paragraph 2, first sentence) - Editorial

Page 92 (paragraph 2, last sentence) - We have inserted the first sentence of the suggested wording. An analysis of the royalty bidding sale was not presented.

Page 96, 99, 1[illegible], 110, 111, 113, 127, 136, 144, 162, 166, 171, 172, 173, 175, 176, 177, 181 (paragraphs 2 and 3), 182, 192, 201, 206, 267, 272, 273, 274, 275, 277, 278, 298 (paragraphs 1 and 4) - Editorial

Page 305 et al. - Estimates of the number of platforms that would have resulted from leasing ten million acres have been deleted from the final EIS, as acreage figures are no longer included in the proposal to conduct six lease sales per year through 1978.

Pages 305, 306, 316, 369, 372, 381, 393, 454-460, 456, 573 - Editorial.

Page 676 - Resource estimates have been revised by USGS since these comments were prepared.

Volume 2

Pages 46, 61, 93, 94 - Editorial

Page 99 - This information was not available.

Page 141 - Editorial

Page 155 - This information was not available.

Page 156 - Statement has been deleted.

Pages 157-212 - Most of the major spills that have been intensively studied have been refined products. The fact that refined products are more toxic due to a larger percentage of soluble aromatics does not prevent their inclusion as indicative impacts, as long as the material is identified. By the same token, laboratory studies of the effects of various crude fractions are used to describe possible impacts of crude oil spills. It is repeatedly stated that crude oil is less toxic than refined products.

Page 169 - Although Section III on Impacts has been substantially revised to a more analytical framework, and these quotations from various scientists have been dropped, a word should be said here. Prediction of environmental impacts is a speculative endeavor, and solid scientific information on large scale or long term effects is often lacking. In these situations, it seems incumbent on EIS preparers to prsent the full range of scientific opinion concerning potential long term and/or large scale impacts. This should in no way be construed as an endorsement; the very lack of solid data prevents endorsement or criticism.

Page 178 - In the new section on impact of drilling muds, barium sulfate is identified as being expensive, and thus reclaimed and reused. However, we have no data on the completeness of recovery.

Page 217 - It is felt that this is a straightforward presentation. See Fish and Wildlife Service comments for lack of criticism on this section.

Page 263 - The disposition of drilling muds is actually a more complex story. While it is true that muds are reclaimed (especially the barite, which is probably 90% of the mud components by weight) and reused, eventually, after several wells, the mud is fouled enough so that reclamation is no longer effective. In dry holes, much of the mud may be left in the hole before plugging and abandonment. It is also possible that an entire batch of mud may go overboard, since no objective observer has ever spent the time to follow a batch of mud through its lifetime. Regardless of that, it is improper to characterize the mud that does get discharged as simply "turbidity-producing." Several of the components are toxic (see Falk and Lawrence, 1973); these too are being discharged into the ocean.

Pages 287, 292, 307a, 309 - Editorial

Page 325 - The amount of acreage leased to date has been made consistent throughout the EIS; 11.5 million acres through Sale #37.

Pages 329, 335, 338, 412, 412-413, 416-417, 425-426, Attachment B, Attachment I - Editorial.

ADDRESS ONLY THE DIRECTOR,
FISH AND WILDLIFE SERVICE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
WASHINGTON, D.C. 20240

In Reply Refer To:
FWS/OBS

FEB 26 1975

Memorandum

TO: Director, Bureau of Land Management

Acting Associate
FROM: Director, Fish and Wildlife Service

SUBJECT: Draft Environmental Impact Statement Concerning the Proposal to Increase Outer Continental Shelf (OCS) Oil and Gas Leasing to Ten Million Acres in 1975

In response to your October 25, 1974, request, we have reviewed the subject statement and offer the attached comments.

We appreciate the opportunity to review and comment on this draft environmental impact statement.

W. T. Olds, Jr.

Attachment

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT CONCERNING THE PROPOSAL TO INCREASE OUTER CONTINENTAL SHELF (OCS) OIL AND GAS LEASING TO TEN MILLION ACRES IN 1975

General Comments

We believe the draft EIS is too vague and general to be useful as a decisionmaking document. There are, of course, valid reasons for this generalized approach as pointed out on p. 15 of the EIS ("Underlying Assumptions"). While we accept this reasoning, we nevertheless believe that this document is incomplete and does not fulfill its basic purpose--elucidating environmental impacts. In fact, it is emphasized throughout the text that available data are not sufficient to adequately quantify the magnitude of the environmental impact that could possibly result from leasing of ten million acres of the OCS for oil and gas exploration as proposed.

Generally speaking, one of the more disturbing aspects of the statement in relation to potential impact of accelerated OCS leasing on biological resources is the repeated emphasis that oil spills constitute the worst disaster that could befall those resources. This idea is stressed throughout the document to a degree that other potential impacts, which could possibly be even more devastating, are virtually obscured. This point can perhaps be best exemplified by examining Vol. II, pp. 157, 172 and 190 - 211. The discussion in the latter section, for instance, concerns "possible impacts on biota with respect to such factors as quantity, frequency of occurrence, and duration of hydrocarbons in the marshes, bays, sounds, beaches, and artificial and hard substrates of all coastlines." The section introduction goes on to state, "pertinent information will be included, when available, concerning such categories of potential impacts as organisms response to oil, direct toxicities, both lethal and sublethal, incorporation or uptake of hydrocarbons by organisms, oil coating, and the unique habitats and characteristics of different geographic areas." It is recognized that probably more data are at hand on the immediate environmental effects of significant oil spills than are available for long term chronic pollution or other damages occasioned by petroleum related activities. It is interesting to note however, that of the 89 animals listed as threatened or endangered species (Tables 77, 78, 79, and 80, Vol. II, pp. 205 - 211), 43 have been listed with habitat destruction, not pollution, mentioned as a prime cause of their decline. Habitat destruction was mentioned for none of the Alaskan species, but accounts for 13 of the 17 animals in the Gulf of Mexico area, a location where petroleum production has been going on for years. The peripheral activities associated with oil production may indeed be more dangerous to the living environment than any number of oil spills experienced to date.

The discussion on Alaska's commercial fisheries (Vol. I, pp. 536 - 541) is very disappointing. The whole section is poorly put together with many misspellings, several structural problems and a number of serious errors. The great importance of Alaska Commercial Fisheries, relative to other environmental features which will be affected by OCS development, is certainly not apparent from this document. From a number of standpoints, the commercial fisheries of Alaska should command a larger discussion in the statement than they have thus far received.

1. Economic - Historically, commercial fishing has been Alaska's biggest industry. In the ten year period 1963-1972, Alaskan fishermen and processors produced products wholesaling at nearly 1.7 billion dollars. The final value at retail, including intermedial costs, undoubtedly added several more billion to the gross national product, all of which is directly attributable to the Alaskan resource.

2. Social - The number of fishermen and processors directly engaged in Alaskan fisheries during the 1963-1972 period has averaged about 49,500. Many additional thousands of Americans are also directly or indirectly affected by what happens to the Alaskan Fishery Resource.

3. International - Data are incomplete on the financial and social value of our fish resources to other nations; but during the past ten years, both the Soviet Union and Japan have expanded their distant water fleets and have processed billions of pounds of fish and shellfish from Alaska's continental shelf. Currently other foreign fleets are also becoming active in these fisheries and it would be safe to say that the investments and returns are substantial.

4. Environmental - The bulk of animals making up Alaska's fishery resources are associated with the Continental Shelf during all or at least part of their lives. Unique combinations of environmental factors have been responsible for the tremendous number of these organisms and alteration of those factors--perhaps only slightly--could produce profound effects on the abundance.

Although the various biological communities found along the Atlantic coast are generally described in the draft environmental statement, little detail is provided. These coastal communities constitute some of the nation's most valuable fish and wildlife resources, and they are highly subject to adverse environmental impacts resulting from the construction and operation of onshore facilities, such as pipelines and terminals that will be associated with the development of offshore oil resources. Empirical data exist concerning the distribution and areal extend of coastal wetlands, such as fresh and salt marshes, mangrove swamps, and open sounds and bays, found on the Atlantic coast. Considering the importance of these communities, this information should be provided in the final statement. The final statement should list the relative acreages of each community type in the individual Atlantic coastal States or zoogeographic zones.

Basic catch data for the Atlantic commercial fishery are included in the draft statement; however, sport fishes, wildlife, and waterfowl received little attention. These groups of animals constitute major coastal biological resources, and they contribute greatly to the recreational and economical resources of coastal regions. Consequently, a description of the resources of the Atlantic coastal zone should, in the final statement, be expanded to provide some details about these groups of animals. In terms of sport fishes, the principal game species for each zoogeographic region (both inshore and offshore) should be described, and available information on fishing effort should be provided. Similar information on the valuable wildlife and waterfowl populations of the Atlantic coastal area should also be provided in the final statement.

Hunting is a major recreational activity throughout the Atlantic coastal area; however, hunting resources are barely mentioned in the draft environmental statement. Two types of hunting that occur directly on coastal waters are waterfowl and marsh hen hunting. Other types of hunting occur on adjacent uplands. Hunting resources should be thoroughly discussed in the final statement.

Some of the major impacts of offshore oil exploration and development will occur in the inshore area, and these impacts will be more conspicuous than those in the offshore zone. Coastal wetlands provide high-quality wildlife and waterfowl habitat, and most commercial and sport fishes are dependent on estuarine waters during some part of their life cycle. Therefore, any potential adverse impacts on these areas should be fully described.

The environmental impacts described in the draft statement are primarily concerned with oil spills. The impacts of related onshore development have received very superficial treatment. In fact, expected onshore development is not described except for vague references to pipelines, terminal stations, and related roads and facilities. The types and degree of onshore development expected to result from offshore oil exploration and development should be projected and the adverse environmental impacts associated with the construction and operation of these facilities should be thoroughly explored. Additional information on pipelines should be provided within this volume including known and anticipated impacts from leakage. Toxic materials leaked from buried pipelines might not be limited to benthic organisms but could be passed up the food chain to top predators.

The draft statement could also be improved and strengthened through incorporation of more analytical and quantitative data on past oil spills and current pollution levels which have resulted from oil and gas development operations to date. Additionally, oil spill trajectory information for each OCS area, particularly if related to locations of important living resources, including sensitive environments, would seem to be useful information for a document of this kind.

Specific Comments

Volume I

Section 1.A.1. lacks a quantitative definition of the proposed action's purpose or purposes. This information is prerequisite to identification and consideration of alternative actions. For example, if the purpose is to increase by a given amount the domestic production of oil and natural gas, then Sub-sections 2, 8, and 11 of Section VIII.F. are relevant. If the purpose is to increase by a given amount the domestic production of fossil fuels, then Sub-sections 2, 4, 8, and 11 are relevant. If the purpose is to reduce by a given amount the imports of oil and natural gas, then Sub-sections 2, 3, 4, 5, 6, 8, 9, 11, and 12 are relevant. In any case, relevant sub-sections should be expanded; they now lack the quantitative detail that is prerequisite to conclusions about whether alternative actions are ecologically and economically feasible.

These deficiencies are not serious, if the decision to lease an additional ten million acres has already been made (as one may infer from the quoted Presidential directive on Page 3 of Volume 1). If, on the other hand, the environmental statement is intended as a planning document and basis for future administrative policy decisions, the deficiencies severely limit the statement's value.

I.B.c.(2)(d), Page 28:

BLM tract selection process as discussed gives no indication of consideration of environmental concerns and/or critical or unique biological resources.

I.D.2.g. (5)(a), Page 116

It should be pointed out that in addition to commenting on environmental impact statements, the Service will be involved in evaluating the impacts on fish and wildlife resources of drilling platforms, pipelines, ancillary onshore facilities, and waste disposal, as part of the regulatory programs administered by the Corps of Engineers, U. S. Coast Guard, and Environmental Protection Agency. The Service also furnishes resource information for inclusion in impact statements and participates in development of special lease stipulations.

I.D.3.d., page 122, paragraph 2:

The statement, "An animal receives no additional Federal protection as a result of having been placed on the "List of Endangered Native Fish and Wildlife," is in error. This list is specifically identified in Section 4(c)(3) of the "Endangered Species Act of 1973," and the species listed thereon are subject to Section 9 which affords additional Federal protection.

I.D.5.a, page 126:

Reference is made to "newly acquired baseline and monitoring information." We were not aware of initiation of monitoring activities in the OCS program.

Page 128, paragraph 1:

This seems like a 'cart before the horse' statement to assume that adequate recommendations and stipulations could be written to mitigate potential damage to frontier areas, as stated on page 185, Volume II, when on the referenced page it acknowledges that "there are large gaps in the scientific information that cause problems in analyzing and predicting the impacts of OCS oil and gas development."

I.D.5.c.(2), page 138:

Description of the sample stations is unclear. Were these 15 one-meter square stations?

II.A.1.d., page 555, last paragraph:

"Anadromous species 'spend a portion of life in salt water, and ascend freshwater streams to spawn,' rather than ' . . . swims into the estuaries to spawn."

Same, page 257, last paragraph:

Depth designation (15-200 meters) for offshore is inconsistent with that (20-200 meters) shown in line 5 on page 253.

II.A.1.d(6), page 261:

We disagree with the statement, " . . .no natural occurrence of rock." There are many references in the literature of natural rock outcroppings, etc., along the coastlines of: Florida (A Survey of Offshore Fishing in Florida, by Martin A. Moe, Jr., January 1963 - Professional Papers Series #4, Florida State Board of Conservation, Marine Laboratory, St. Petersburg, Florida, pp. 10-27): North Carolina (your reference, page 263, VIMS, 1974 and URI, 1974): and Georgia.

II.A.2.d(1), page 332:

The dinoflagellate, Gyminodium sp. should be included in the Gulf phytoplankton assemblage inasmuch as it is probably the most significant genera from the standpoint of economic loss due to severe fish kills as a result of red tide.

II.A.2.d(3), page 336:

The seagrasses were not previously discussed, but rather in a later section (page 532) of the statement.

II.A.3.d, page 428:

This section should include a discussion of whale migrations through and outside of the Channel Islands area.

(1) Phytoplankton, p. 430, paragraph 1 -- The impression is given that all Gonyaulax blooms produce toxins. In fact only a few species of Gonyaulax are toxic and these species produce only a small percentage of the red tides off the west coast of the U. S.

(3) Benthic Biota, page 434 -- If possible, the distribution of benthic biota should be presented here in map form to allow: (1) estimation of probability of damage from OCS operations, and (2) determination of areas where further study is needed. It should also be pointed out that most of the benthos data presented here is for the continental shelf proper, whereas the majority of lease areas off southern California are over deeper bottoms. More information about benthos in these deeper waters is needed.

(5) Birds, page 445, paragraph 3 -- The Channel Islands should also be described in this section as they are the most important sea-bird habitats off southern California.

(6) Unique Environments -- This entire section lacks depth -- as these are environments of critical importance, one would expect their description to be more detailed. One especially important point is neglected on p. 451, paragraph 1 -- that Anacapa Island is the only active breeding ground off the west coast of the U. S. for the endangered brown pelican.

II.A.4., page 467, line 8: Spell Aleutian.

page 469, line 2: N45°E?

page 469, line 4: Spell (Von Huene)

page 469, line 27: Spell Heceta

Fig. 83, page 470, Caption: Spell Von Huene

page 533, lines 5 & 6: Amphipods and euphausiids are two separate orders of Arthropods. Parathemisto pacifica is an amphipod. One of the most abundant euphausiids along the Pacific Coast is Euphausia pacifica.

page 534, line 8 and many others: Spell Arctic

page 536, last paragraph: Should stress at present time.

page 537, lines 13 and 14: Not true for Bering Sea.
last sentence: Who or what is AEI and DC?

Table 25, page 538: Table unclear as to distinctions between USA and Alaska. Halibut, an important species, does not seem to be included.

pages 542-547: Marine Mammals. There are three orders or marine mammals. Mysticeti and Odontoceti are suborders of the order Cetacean.

This section can and should be expanded to include a more specific species discussion of distribution, seasonal occurrence, and unique habitat areas, i.e., sea lion rookeries, etc. Distribution and/or migration pattern maps would be of value. The following references may be helpful:

Discussion paper, Consideration of a Waiver of the Moratorium and Return of Management of Certain Marine Mammals to the State of Alaska. Prepared by an Interagency Task Group of NMFS - USFWS, Washington, D. C., August 1974.

Distribution and Abundance of Sea Otters, Sea Lions, and Harbor Seals in Prince William Sound - Summer 1973. Kenneth W. Pitcher and John S. Vania, Alaska Department of Fish and Game, Anchorage.

pages 548-553: Coastal and Marine Birds. This section is incomplete, erroneous, and contradictory in presenting the facts relative to numbers of birds. Department of Interior, Fish and Wildlife Service, National Wildlife Refuge System reports and proposals recently prepared for inclusion of additional areas within the National Wildlife Refuge System should provide reference sources for correcting this section. The following reference can also be used and will provide specific information for updating page 549, para. 2:

Birds of the North Gulf Coast - Prince William Sound Region, Alaska. M. E. "Pete" Islieb and Brina Kessel, Biological Papers of University of Alaska, No. 14, November 1973.

pages 554-555: There are maps available to show the location of seabird colonies and wildlife refuges. Since these areas are considered critical habitat, charts indicating their physical relationship to designated locations of OCS oil and gas development would be of value.

pages 556-557: This section is extremely brief and considering the wide range of natural hazards extant in Alaska, should be expanded with some examples of past natural disasters.

II.B.1.b.(3)

The statement that mangrove swamps are an important shoreline community south of Cape Hatteras on page 563, is an apparent error. The writers must have been referring to Cape Canaveral since mangroves are sparsely distributed north of this point.

II.B.1.c(1), page 619:

Swan Quarter and Pungo National Wildlife Refuges located in Washington and Hyde Counties, North Carolina.

Same, page 623:

A portion of Santee National Wildlife Refuge is in Berkely County.

Same, page 626:

Tybee and Wassaw National Wildlife Refuges located in Chatham County, Georgia.

Same, page 627:

Wolf Island National Wildlife Refuge in McIntosh County, Georgia.

Same, page 631:

Lake Woodruff and St. Johns National Wildlife Refuges located in Volusia and Brevard Counties, respectively.

Table 41, "Recreational Resources - South Atlantic," pages 646-649:

A. Acreage figures shown for a number of national wildlife refuges are incorrect, several of which included the entire acreage within the Proclamation Boundary, only a portion of which is actually in refuge ownership. Correct acreages for the respective refuges are as follows:

North Carolina (page 646):

Pea Island National Wildlife Refuge - 5,894 acres
Swan Quarter National Wildlife Refuge - 15,501 acres

South Carolina (page 647):

Cape Romain National Wildlife Refuge - 34,218 acres
Savannah National Wildlife Refuge - 7,617 acres (S.C.)

Georgia (pages 647-648):

Savannah National Wildlife Refuge - 5,555 acres (Ga.)
Okefenokee National Wildlife Refuge - 377,527 acres - portions in Charlton, Clinch, and Ware Counties, Georgia, and Baker County, Florida
Wolf Island National Wildlife Refuge - 5,126 acres

Florida (page 648):

Merritt Island National Wildlife Refuge - 140,393 acres
Pelican Island National Wildlife Refuge - 4,359 acres

B. Refuges omitted from Table 41 include:

North Carolina (page 646):

Pungo National Wildlife Refuge - Hyde and Washington Counties - 12,351 acres

Georgia (page 648):

Wassaw National Wildlife Refuge - Chatham County - 10,242 acres

Florida (page 649):

Hobe Sound National Wildlife Refuge - Martin County - 490 acres
Loxahatchee National Wildlife Refuge - Palm Beach County - 145,635 acres
St. John's National Wildlife Refuge - Brevard County - 2,072 acres
Lake Woodruff National Wildlife Refuge - Volusia and Lake Counties - 18,417 acres

pages 560 and 561: change Enteromorphos to Enteromorpha

page 740: This reference to the Bureau of Sport Fisheries and Wildlife and all other similar references should be changed to reflect legislation which has changed the name of this agency to the U. S. Fish and Wildlife Service.

Table 52, "Inventory of Recreation and Historic Resources of the Gulf of Mexico," page 746:

A. Errors in Federal wildlife refuges were noted as follows:

1. Anclote National Wildlife Refuge is not State owned.
2. Passage Key National Wildlife Refuge is now designated also as a wilderness area.

B. Refuges omitted from table include: Matlacha Pass National Wildlife Refuge; Caloosahatchee National Wildlife Refuge; and Egmont Keys National Wildlife Refuge

C. Aquatic Preserve omitted from table: Pine Island Sound.

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II.B.3.b., page 9:

All of the more important estuaries and bays of southern California should be listed and described here.

page 12: The statement that the importance of estuaries as nursery areas is "obvious" only detracts from their value--after all, most of the information in this statement is obvious to those who are familiar with the particular subject area covered. Which species or groups of fish are most dependent on the estuaries? What percentage of the total fish population over the continental shelf of California is dependent on estuaries?

II.B.4:

page 111: Alaska coastline 6,500 miles long; page 121 - Alaska coastline 47,300 miles long???

pages 121-153: C. Resources of the Coastal Zone. This section is rather confusing since it includes a discussion of both resource users and resources

In this particular section for other geographic regions, i.e., Pacific coast, etc., Wildlife Refuges are mentioned as a recreational use of the area. There are several National Wildlife Refuges in Alaska in areas specified for potential OCS oil and gas development; however, they are not discussed. This situation should be corrected.

page 122, lines 5-6: The resource industries depend on the support sector?? This seems to be another 'cart before the horse' statement.

page 123, line 5: Should be "Pacific salmon. . ."

page 142: Military use of coastal zone is a land use, not a resource.

page 153: (1) Water quality - should mention forest industry wastes.

page 157: Environmental Impacts of the Proposed tion. This section presents very little hard data on which to base any conclusions as to environmental impact of the proposal. Impacts are discussed in only the most general way.

Considering the scope of the proposal, perhaps this is understandable. Nevertheless, this does not absolve one of the responsibility to make as complete and detailed an investigation of impacts as necessary. It is stated elsewhere that once tracts in specified geographic areas have been selected for possible leasing, site-specific draft environmental impact statements will be prepared. It is our concern that unless a more detailed analysis has been made of specific areas before that point is reached, the process may have become irreversible, with the result that great environmental damage may eventually occur.

On the other hand, with future technological advances in drilling techniques and oil spill protection, enlightened land use schemes to control ancillary onshore facilities and virgorous application and implementation of existing and future local, State, and Federal regulatory controls, serious environmental damage may be prevented. Ahern1/, in writing about oil development on Georges Bank, states on Page 113, "Petroleum development on Georges Bank could be in conflict with use of the area as a fishery. However, the adverse impacts on fishery productivity would be negligible, a conclusion also reached by the MIT Offshore Oil Task Group." However, Ahern's study contains many assumptions, was completed in one year, and did not analyze the possible adverse impacts of near-shore oil spills on the New England Coast.

III.B.1.a.

Plankton -- Although evidence of reduced productivity is limited, oil induced changes in species composition have been predicted -- how would this affect the marine food web?

page 170, paragraph 1, last sentence -- No explanation is given for the conclusion that oil spills from Outer Continental Shelf operations are unlikely to reach the shores. It seems logical to assume that under rough sea conditions (making cleanup efforts ineffective) oil slicks could easily travel three miles. Have not past spills travelled this far and farther? This is an exceedingly important point and should be elaborated upon before the final EIS.

page 172, paragraph 2, last sentence -- While the conclusion that oil spill effects will be adverse only locally seems

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1/ Ahern, William R., Jr., 1973. Oil and the Outer Coastal Shelf, The Georges Bank Case. Ballinger Publishing Company, 133 pp.

reasonable, it is also possible that this may be significant for certain meroplanktonic vertebrate and invertebrate larvae which show a limited distribution. This question may require further study.

Nekton -- While pinnipeds do not seem to be especially affected by oil, sea otters are extremely sensitive to oil.

page 175: "Benthic Marine Life" should be "b" in the outline.

page 175, paragraph 1: Include sea otters and their well known vulnerability to pollution.

page 176, paragraph 2: Are there any limits as to what may be required by such special stipulations? If so, what are they?

III.B.1.b., page 179:

We feel there is inadequate discussion on impacts to coral communities by drill cuttings, jetting, and turbidity. These stationary animals can be destroyed by deposition of silt and/or cuttings, physically removed by jetting and recolonization, if ever, would be an extremely slow process.

III.B.1.c.

page 180: Suggest mortality due to platform light attraction and collision be discussed. For instance, in the Gulf of Alaska there are reported occurrences of the fork-tailed petrel coming aboard ships, apparently attracted to deck lights.

page 183, last paragraph, line 2: Correct acreage for Delta National Wildlife Refuge is 49,000 acres, and line 3 - that for Breton Islands is 4,507.

page 183, line 22: The fact that time of year an oil spill might occur is a significant point in recognizing impacts on seabird and waterfowl populations.

In addition, onshore development and platform aircraft support activities should be discussed relative to seabird harassment, nesting and hatching success, panicked flushing of nesting adults and egg loss, frightened immatures leaving nests before ready, etc.

III.B.2.

pages 186-187: And marine mammals??

page 187, paragraph 1: Contrary to the experiences in the Gulf of Mexico with commercial finfish and shellfish mentioned, as a result of an oil spill off Guanica, Puerto Rico, in 1962, fishing industries of Guanica "experienced not only damage to gear but also an obvious depletion in fisheries resources in the area". Mangrove ecosystems were severely damaged by the Guanica spill directly proportionate to the amount of oil spilled (Diaz, 1962).

page 187, paragraph 3: Benthic Marine Life -- It should be noted that Forrester (1971) reported oil at depths of 80 meters (not exactly the shallow littoral) resulting from the Chedabucto Bay oil spill.

page 188: Oceanic Birds: If there is generally no measure that can reduce bird kills caused by massive oil spills except fast-response, effective spill clean-up, then we have virtually no way to prevent bird losses in the Gulf of Alaska. Weather and sea conditions in the Gulf would significantly reduce, if not prevent, the efficiency and use of spill containment and clean-up equipment. This whole section takes on a rather fatalistic tone and suggests that fish and wildlife conservation agencies have little to contribute to the effective protection of biological resources on the continental shelves.

III.C.

In this section there are numerous references to impact studies as a result of oil spill occurrences in the warmer waters of the Gulf of Mexico and off California. Results of these studies are not necessarily applicable to cold water species found in Alaska.

page 190, line 18: We would think that tankers and their operations are directly related to offshore oil production, at least in some of the "frontier areas" since they would not be in evidence except for that production.

page 197, paragraph 2: In a paper by Blumer et al (1973), small quantities of crude oil were shown to interfere with some specific, possibly chemosensory, behavior of the lobster. Observations as in the Arrow spill study (Operation Oil, 1970), probably would not have discerned these differences.

III.C.1.a(6), page 202:

There are substantial numbers of island bird rookeries on the east and gulf coasts as well as on the western United States coast and Alaska. Additionally, waterfowl, wading birds, and wildlife may suffer complete loss of annual reproduction as a result of direct mortality to adults and/or induced migration during the reproduction period.

III.C.1.a(6), page 204:

This section on Endangered and Threatened Fish and Wildlife is essentially correct based upon Resource Publication 114, March 1973, "Threatened Wildlife of the Unites States," 1973 Edition. However, this information is not consistent with the subsequent Endangered Species Act of 1973 and the "United States List of Endangered Fauna" - May 1974, and should be revised in accord with these documents.

Table 77, page 205 and Table 78, page 207: The range of the Florida great white heron is from Biscayne Bay to Charlotte Harbor.

Table 77 incorrectly lists the eastern brown pelican, southern bald eagle, Eskimo curlew, and Bachman's warbler as "threatened" species. All four are "endangered." The table also lists as "endangered" species several that are "threatened": sperm whale, blue whale, finback whale, sei whale, humpback whale, right whale, and Caribbean monk seal.

Table 78, page 207: Endangered watercress darter - Etheostoma nuchale - E - Alabama is omitted.

III.C.1.b.

pages 212-218: This section only discusses pipes coming ashore in soft beach areas, which would be returned to natural condition relatively quickly. What about rocky shore areas?

page 217: This section does not discuss the potential impact of over harvest as a result of these "artificial reefs" (platforms) attracting and concentrating the fish to make them readily available to the fishermen.

III.C.2.a.

page 251: (3) Wetlands. Suggest adding Alaska to list of areas where significant wetlands exist.

page 252: (4) Artificial and Hard Substrate Communities. Barnacles, mussels, sea urchins, abalone, etc., may "not represent a significant part of the ecosystem" in Louisiana, but the Alaska situation is somewhat different.

III.C.2.a.(6)

page 253: Inasmuch as "unutilized land" is, in fact, wildlife habitat, we question the statement that "impact" is expected to be minimal in areas where sufficient unutilized land is available." Marine mammals and shorebirds should also be included here.

III.C.2.b.(5)

page 258: The statement that the only adverse effects of offshore operations on sport fishing would result from massive oil spills is incomplete and should be expanded to discuss the potential impact that drilling operations could have on coral reef communities. The destruction of this important habitat through the discharge of cuttings, muds, or formation waters could also have significant adverse effects on sport fishing.

The prime marine sport fish species sought in Alaska (salmon and halibut) will not necessarily be attracted to offshore platforms.

III.E.1.

page 267, line 7: Or herring, or urchins, or abalone, or intertidal pink salmon eggs, etc.

III.E.2.a.

page 269, line 9: Include scallops.

The second paragraph of Page 270 correctly identifies relative spacing of platforms as an important factor affecting commercial fishing activities. The environmental impact statement should indicate what typical spacing would be.

III.E.2.b.

page 270. In the SE Bering Sea large numbers of foreign trawl vessels could encounter these underwater obstructions. Some foreign gear is large enough to break off stubs and drag unburied pipelines resulting in economic loss to the oil companies and possible spills.

III.E.3.

Page 274, last paragraph. Indicates the proposed leasing could result in 1,600 additional platforms on the OCS, precluding commercial fishing over about 8,000 acres of sea floor. These estimates differ from estimates of 500-1000 platforms and 1500 acres, mentioned on pages 305 and 311. This apparent inconsistency should be eliminated.

VJ. There is no discussion in this section of the impacts or cumulative effects on magnification of discharges resulting from a number of wells being developed in proximity to each other.

Page 316: Conflict with other Uses of Land. Considerable difficulties may arise in Alaska because of current land settlement and selection processes. This could be especially critical in the case of d2 lands.

What is the situation with deep water ports on the Pacific coast? Is this document the proper forum to discuss the siting of deep water ports?

VII.C.

Page 3[illegible]2: An additional irreversible or irretrievable commitment of fish and wildlife resources and their habitats would be that acreage lost to construction of onshore facilities.

Page 323: Does not take into consideration relative wildlife populations in other areas compared to the Gulf of Mexico; oil spill clean-up capabilities in other areas; intensity of drilling and tanker traffic; or any number of other dissimilar factors.

VIII.D.1.C.

Page 340. Something is grammatically wrong with this paragraph. At any rate, it sounds like we are being offered a poor choice of having "piecemeal unorderly" offshore development if we delay leasing, or a lesser "degree of coordinated planning between states and federal government" in relation to environmental impacts in coastal areas, if we accelerate leasing. From the point of view of impact on biological resources, we would opt for the former.

VIII.E.1

Page 345. By virtue of the initial statement, the last sentence is incorrect in that hydrocarbon reserves could still be developed on leased tracts.

VIII.J

Page 425. This section seems to contain a contradiction. In the second paragraph it states "this may be the time when more stringent requirements and better designed technologies should be demanded". The third paragraph states "to require 'best available demonstrated environmental control technology' in frontier areas runs the risk of reducing or even curtailing operation in some otherwise favorable locations by changing the economies from profitable to unprofitable." Assume here the meaning implied, is, we should attempt to improve OCS technology somewhat, but should not, just because of environmental values, go so far as to delay rapid development of the OCS at the expense of profits.

Typographical erros noted as follows: (omitted or incorrect portion underlined).

Volume I

Table of Contents - IB Management

Sec. I.A.2 - page 9, line 12 - reference to Figure 1 which is not shown.

Page 130, first paragraph, line 3 - (Casco Bay, Maine).

Page 137, last paragraph, line 3 - (SUSIO), and an

Page 562, first paragraph, line 1 - brown

Page 567 - change Juncus roemerionus to Juncus roemerianus.

Page 169, second paragraph, line 8 - Refuge

Page 626, Sector #8 - Glynn

Page 631, last paragraph, line 5 - Merritt

Page 646, line 3 - Mattamuskeet NWR; line 11 - Dare Gameland and Dare Co.

Page 648, line 4 - Altamaha; line 8 - Oke_fenokee

Pages 708-709 - Change Distichilis to Distichlis

Page 711, second paragraph, line 5 - Phragmites

Page 712, paragraph 4 - Freshwater marshes are extensive throughout the Louisiana coastal region except in the area east of the Mississippi River exclusive of the Mississippi River Delta.

Page 715 - Change Timbaliere to Timbalier.

Page 716 - Change Distichilis to Distichlis.

II.B.2.C.(2)(b), page 744, last paragraph, line 1 - 2.3 million anglers

Table 52, page 746 - refuge names misspelled:

D. Chassahowitzka
H. J. N. Ding Darling NWR

Volume II

Page 173, second paragraph, line 2 - quickly; third paragraph, line 13, difference

Page 185, last paragraph, line 7 - given

Page 207, line 1 (Table 77) - species name Okaloosae

Page 215, first paragraph, line 3 - require

Page 263, last paragraph, line 10 - Trawls

Page 269, second paragraph, line 9 - area

Page 284, last paragraph, line 2 - to

We acknowledge the fact that more detailed environmental impact statements are to be prepared on a site specific basis; however, this should not detract from including the most useful, complete and correct information in this draft environmental impact statement.

Fish and Wildlife Service (FWS)

The Fish and Wildlife Service submitted detailed substantive comments of both a general and specific nature. Many of the specific comments are of an editorial nature (typographical errors, misspellings of species names) and have simply been noted as such in our response. These editorial changes have been made in the appropriate location. FWS comments are denoted by the page number in the draft EIS, where possible.

Disposition

General Comments

Page 1 - para. 2 - While it is recognized that habitat loss through pipeline and onshore construction, as well as other activities, can have significant impacts on biota, it is still felt that, for both the short and long term, primary environmental effects are derived from oil discharges. Discharges in this case refers to both accidental oil spillages and chronic low-level polluting discharges which are attendant to normal operations. It was more a lack of precision in word selection than a conscious overemphasis on "oil spills" (meaning accidental discharges) that lead to the preception shared by many that the EIS stresses this causative factor in improper proportion. The final EIS considers total discharges as the single most critical impact producing factor, but recognizes all other types of impacts.

Page 2 to end of general comments - Much of the very detailed information which FWS is requesting be portrayed in this program EIS is more properly relegated to site-specific EIS, e.g., an extensive discussion of impacts on Alaskan fisheries (both on the fishery and the economic structure of the industry). In response to a BLM request for information on fish and wildlife resources in all OCS (and nearshore and onshore) areas, the FWS prepared a document which indicated the outstanding biotic resources in each of the 17 areas. This document is presented in toto in Section III on Impacts. The BLM then abstracted this document into a matrix format to highlight in a concise fashion the FWS material. Much of the detail which FWS requests in the comments is found in Section III. Onshore effects are more fully addressed, albeit mostly in a generic sense. The extent of onshore development is determined primarily by the level of production that develops, a level that can not be accurately estimated before exploratory drilling. More analytical data from past oil spills is used for the area-by-area comparison of impacts in Section III. Oil spill trajectory information is incorporated under Proximity in Section III.

Specific Comments Volume 1

Section I.A.1. - This section has been substantially revised to reflect the refinement of the proposal to six sales per year through 1978 as denoted on the tentative planning schedule. This refinement allows closer focussing on the purpose of the program and its proposed implementation. The purpose includes all three of the possible purposes suggested by FWS. Additionally, Section VIII on Alternatives has been extensively revised to define the viable alternatives to the proposal.

Page 28 - The discussion of tract selection has been expanded to indicate how environmental factors are considered.

Page 116 - These responsibilities of FWS have been added to the EIS.

Page 122 - The correction has been made regarding the additional Federal protection afforded species place on the "List of Endangered Native Fish and Wildlife."

Page 126 - A monitoring program will begin in June, 1975 in the eastern Gulf of Mexico as a programmed follow-on to the baseline study recently completed.

Page 128 - Recognizing that there have been and will continue to be large gaps in the scientific information regarding the impacts of OCS development, it is still possible to develop recommendations and stipulations governing development based on that fact, i.e., err on the conservative side of regulation until specific problems regarding these stipulations can be answered.

Page 138 - This was supposed to read "15 master stations."

Page 255 - Editorial.

Page 257 - The 15 meter designation was incorrect; should have been 20.

Page 261 - Occurrences of natural rock outcrops have been noted and the reference revised.

Page 332 - We agree that Gymnodinium sp. should be included in the list of important phytoplankton, but not Gyminodium (sic).

Page 336 - Editorial

Page 428 - Whale migration patterns in Southern California will be discussed in a site-specific EIS.

(1) The correction on Gonyaulax toxicity has been made

(2) Distributions of benthic biota are difficult to discover, and, even if known, should be handled in a site-specific EIS.

(5) This suggestion has been incorporated in Section II.

(6) These areas are merely identified as unique in this program EIS, without complete description, a matter for a site-specific EIS.

Pages 467, 469, 470, 533, 534, 536, 537 - Editorial

Page 538 - Table taken from Gulland, 1972.

Pages 542-547 - Ordination of marine mammals has been revised. The additional information requested is more appropriate to a site-specific impact statement.

Pages 548-553 - Acknowledged references were used in compiling this section. Better estimates should be available at the conclusion of baseline environmental studies which BLM is funding in this area.

Pages 554-555 - This information will be portrayed in a site-specific EIS.

Pages 556-557 - The intent of this section was only to highlight those natural hazards which were discussed elsewhere in the EIS; they will be more fully discussed in a site-specific EIS.

Page 563 - Editorial

Pages 619, 623, 626, 627, 631, 646-649, 560, 561 - Editorial

Page 740 - Where reference is made to ongoing responsibilities and new publications of U.S. Fish and Wildlife Service, that name will be used. However, in citing publications, the use of Bureau of Sport Fisheries and Wildlife (or even Bureau of Commercial Fisheries) has merit as far as depicting a time period.

Page 746 - Editorial.

Volume 2

Page 9 - Bays and estuaries have not been listed for any region. State publications and sources should be used here for up-to-date information.

Page 12 - The value of estuaries can be and is discussed in various locations without full listing of dependent species or the population percentages requested. This EIS does not attempt to provide this amount of detail, which is more properly the province of a site-specific EIS.

Page 111 - Editorial - 47,300 miles is the correct approximation.

Pages 121-153 - This conflict between resources and users was recognized in preparation of the EIS. However, one section was deemed acceptable because many resources (such as beaches) can only be valued directly in terms of their users. Resources are resources precisely because they are used or consumed, or have that potential.

A more complete listing of refuges has been provided.

Page 122-123 - Editorial

Page 142 - However, land is a resource, and this is how it is being used.

Page 153 - Forest industry wastes have been added to this section.

Page 157 - The entire Section on impacts has been revised to present in analytical fashion a comparison of all the OCS areas, their environmental hazards of development, their most important resources and the proximity of those resources to OCS development and their oil spill potential. The intent here is to present, in relative terms and with as much analytical information as possible, the environmental risks of commencing development of each of our OCS areas. Where hard data is not available, potential impacts have been identified without attaching magnitudes to them. Only after preliminary identification of relative risks can the really detailed assessment begin.

Plankton - Changes in species composition of plankton would affect the marine food web in many and various ways; however, they can not really be identified or quantified, only postulated.

Page 170 - The statement refers to the fact that many of the potential oil deposits are far offshore, and that weathering (and to some degree, cleanup) would prevent most spills from reaching shore. However, in many areas, it is highly probable that oil spills would reach shore (see Section III and CEQ report).

Page 172 - Meroplankters are discussed in Section III.G. on Generic Impacts.

Nekton - The vulnerability of sea otters is well known, and has been noted in several places.

Page 175 - Editorial

Page 176 - Presumably this comment refers to the special stipulations that can be applied to platform discharges. In fact, there are few, if any, limits. However, special stipulations are not applied whimsically, but rather for demonstrated environmental needs. For instance, the discharge of drill cuttings and fine sediments is not stipulated against at the present time because the environmental damage is slight in most areas, both in time and locale. However, in at least one case near flourishing coral reefs (OCS Sale No. 34), such activities were the subject of a stipulation that required shunting these materials to the bottom.

Page 179 - See above. These impacts are mentioned in the EIS under Generic Impacts (Section III).

Page 180 - This impact has been included under Generic Impacts.

Page 183 - Editorial.

Pages 186-187 - This section has been restructured; mammals are included.

Page 187 - The statement referred to diminution of fish catches over large areas of the Gulf of Mexico. The EIS fully recognizes that localized depletion of fishery resources may occur following a large spill.

Page 187 - While petroleum hydrocarbons may be found at great depths following oil spills, it is not felt that this poses a significant direct threat to benthic communities. It is the shallow littoral and intertidal areas where benthic biota suffer the most adverse and quantifiable impacts.

Page 188 - The paragraph in the draft EIS on oceanic birds presents an objective viewpoint regarding birds and oil spills. Clean-up operations will be more difficult, if not impossible at times, in the Gulf of Alaska, possibly translating into higher bird mortalities.

Page 190 - Tankers, and the increased oil spill potential of tankering, are taken into account in Section III in the area-by-area analysis of oil spill potential.

Page 197 - Chemosensory disruptions are discussed in Section III.G. on Generic Impacts.

Page 202 - This information is also discussed in Section III.G.

Page 204-207 - Editorial

Pages 212-218 - Pipeline laying across rocky shores are discussed in Section II and III. See response to Bureau of Outdoor Recreation comment on same topic.

Page 217 - Overharvesting is now discussed as an impact of the "artificial reef" effect.

Page 251 - Alaska's wetlands are extensive and valuable, and have been included in the discussion of impacts on wetlands.

Page 252 - The different importance of these organisms in the Alaskan ecosystem has been noted in Section II on Description of the Environment.

Page 253 - The statement in the EIS refers to the fact that a very large parcel of "unutilized land", i.e., wildlife habitat, would suffer minimal impacts from onshore facilities than would a very small habitat or refuge.

Page 258 - The effects of operations on coral reefs are discussed in Section III, and are related to sport fishing activities.

Page 267 - The fact that year classes of many different kinds of animals may be destroyed by oil spills has been noted.

Page 269 - Editorial

Page 270 - It is impossible at this time to determine what a "typical spacing" of platforms would be that would allow for non-interference with commercial fishing operations. We would also appreciate receiving whatever information FWS has concerning the possibility that foreign fishing gear may be significantly more hazardous than domestic gear regarding stub snagging and breaking and pipeline dragging.

Page 274 - This inconsistency has been eliminated.

Section V.J. - This possible impact is generally subsumed under a discussion of intensity of development, which in frontier areas can only be estimated from hydrocarbon potential. It is nearly impossible to separate the effects from x number of wells in a small area from x number of wells in a large area, although such a synergistic possibility exists.

Page 316 - Additional emphasis has been placed on the effects of OCS development and the Alaska Native Claims Settlement Act. The EIS must look at multiple uses of the OCS, and the potential conflicts of OCS development with other users.

Pages 322-323 - Loss of acreage to onshore facilities is an irretrievable commitment and has been included. The comparison to the Gulf of Mexico experience was strained and has been deleted.

Page 340 - This section has been completely revised.

Page 345 - Much of the undiscovered recoverable resources are located in areas that have not been leased. The FWS is correct in the statement that production could continue from active leases.

Page 425 - This comment puts the environmental v. economic problem in a nutshell. The question is, and will continue to be, how much environmental degradation will we as a Nation forego for energy supplies, and what are the trade off points between requiring sophisticated and expensive environmental control measures and resource development.

The remaining two pages of FWS comments were editorial changes, and have either been effected or deleted from the EIS.

2. State Agencies

In the same fashion and format as the previous section, the State agencies comments on the program and the draft environmental statement are hereafter presented. The Department's position on the disposition of the significant issues raised are to be found immediately following each State's comments.

State of Alaska

The official review comments of the State of Alaska were compiled by the Department of Law. The review document comprises some 150 pages of significant and detailed criticism of the proposed OCS program and the draft environmental impact statement. It was felt that the Alaska comments, like the State of California comments, should not be printed in full due to their bulk. The comments have been summarized below and then addressed on an issue by issue basis. The entire text of the comments has been attached to this environmental impact statement.

The State of Alaska's comments were divided into three sections, and this format will be adhered to in this summary. The first section deals with the timing of the draft impact statement, and the actions that occurred prior to its release. The second section deals with the scope and direction of the impact statement as it relates to a leasing schedule. The third section is an analysis of the impact statement itself.

Timing

1. The draft environmental statement (DES) is merely a post hoc justification for a program already conceded and partially implemented. The NEPA mandates that decision-making analysis begin at the earliest

possible stages of program definition, but actions taken by the Department further the program without complete decision-making analysis, viz. the environmental considerations. In the final EIS, the Department should discuss each resource commitment or other implementing action which has already been taken and explain why they do not compromise the integrity of the decision-making process. The public must be apprised of the full scale of costs and benefits involved in the action, and told how the costs and benefits have been weighed.

2. The following matters are what the State feels need to be discussed by the Department in the final EIS.

a. Budgetary allocations for FY 75 and the budget request for FY 76 show only a percentage of monies being directed to environmental baseline and monitoring studies. A substantial portion is directed at program management, and constitutes an investment in furtherance of the program.

b. The target figure of 10 million acres resulted from a recommendation by the Department to the President in early 1974. Since this recommendation was for initiation of a major Federal action, an impact statement should have been prepared contemporaneously with the recommendation.

c. The programmatic impact statement should have been prepared and reviewed prior to the holding of any lease sales in furtherance of the project. Specifically, calls for nominations for Southern California, the Gulf of Alaska, and the Bering Sea have been issued. Calls for nominations may preclude State advice at a critical stage, and the State is forced to react to what becomes an industry proposal, since nominations come predominantly from industry.

d. The issuance of a planning schedule in November, 1974 for the period 1975-1978 was premature, because it commits resources in such a way as to compel adherence to, and irreversibility of, the schedule.

e. An explanation is needed for the September, 1974 memorandum from Deputy Undersecretary Carter to BLM and USGS calling for a firm leasing schedule that includes a sale in 1975 in both Alaska and the Atlantic.

f. An explanation is needed for the July 3, 1974 memorandum from the Manager of the Pacific OCS Office to the Assistant Director of BLM requesting an allocation of $50,000 for a study of local attitudes toward drilling which would allow an education program for "softening of their present opposition to offshore development."

g. OCS operating orders are being prepared for the Gulf of Alaska, and the State is reviewing them. However, preparation of operating orders at this time can not take into account either baseline environmental information being gathered or environmental information that is gathered for site-specific or programmatic impact statements. The final EIS should address the need for and wisdom of preparing operating orders at this time, and should indicate that environmental information is being utilized in modifying orders for Alaska. Additionally, the USGS is criticized for circulating the draft orders to industry for approval and recommendations before the draft orders were made available to the public for comment.

h. An explanation of Secretary Morton's statement to the oil industry that he intends to ". . . turn them loose over all outdoors . . ." is required. An explanation is also needed for Deputy Undersecretary Carter's remark that waiting for completion of baseline studies would mean not holding any of the lease sales already planned.

Scope and Direction of the EIS

The entire theme of this section is the claim that the fundamental defect of the DES is its failure to define and relate the program to the BLM leasing schedule. The State cites the EPA comments on the DES, which call for, in part, a coordination of the impact statement analysis with the anticipated order of lease sales as depicted in the November, 1974 schedule. The State goes on to say that, because the program is not defined in functional terms, the relative costs, benefits, and alternatives can not be analyzed in a meaningful manner. The State requests that the EIS be redrafted to discuss the "tentative" timetable established in the schedule, providing a comprehensive analysis of all frontier areas of the Nation in terms of relative environmental risk, proximity to market, relationship to regional surpluses or shortages of oil, and to other potential reserves. This assessment should then be used to construct various leasing scenarios and their concomitant environmental impacts.

A discussion of the CEQ report (OCS Oil and Gas - An Environmental Assessment, April 1974) then follows, with specific emphasis on the descriptive and predictive information provided by CEQ regarding the Gulf of Alaska as well as its characterization of the Gulf of Alaska as the most vulnerable (of the areas studied) to major environmental damage from OCS oil and gas development.

The CEQ assessment and the failure of the DES to discuss the costs and the benefits of potentially conducting a lease sale in the Gulf of Alaska in 1975 combine to produce an inconsistency in the program. The EPA and National Academy of Sciences concur with the CEQ assessment of relative risk of development in the Gulf of Alaska. The

National Oceanic and Atmospheric Administration (NOAA) is cited as saying that legal problems on the Atlantic have focused interest on the Gulf of Alaska is a line of least resistance. These inconsistencies should be addressed in the final EIS, the State continues, as well as a thorough discussion of the CEQ report. The final EIS should also discuss the criteria which have been used in preparing the leasing schedule.

The proper mechanism for correcting the lack of clarity regarding the Department's decision-making process is a revised draft environmental impact statement.

Analysis of the Impact Statement DES 74-90

The previous two sections comprise 17 pages of the State's comments. The remaining 143 pages are an analysis of the DES. Presented first are three generic criticisms of the DES, followed by a section-by-section analysis of the DES. Again, the generic criticisms and analysis have been summarized from the State's comments.

1. The first generic criticism concerns the relationship of OCS leasing to national energy policy. Whether there is or isn't a national energy policy is not the question, but rather what is the precise role that expanded leasing will play in the national energy picture.

The State commended the Department on its section on energy conservation, and the use of the Time To Choose report by the Ford Foundation. However, the relationship between energy conservation and accelerated leasing is not made clear. Further, the analytical relationship between alternatives such as conservation and the role of Alaskan OCS in the PAD V market is not explained. Several different sources report an anticipated surplus in PAD V, if both the Trans-Alaska pipeline and the OCS begin producing. The question becomes, "Why engage in precipitous oil exploration in the OCS region of greatest environmental risk and most environmental value, when the oil from the area is simply not needed in the areas of the U.S. where marketing is practicable?" These market restrictions must be addressed in the final EIS.

Long lead times to production in Alaska, both as a result of rig and material shortages and as a consequence of operating in hostile areas, were cited as enhancing the visbility of long term conservation measures and development of alternative energy sources.

2. The second generic criticism revolved around the role of environmental studies. Several sources were cited (CEQ, testimony at National Ocean Policy Study (NOPS) hearings, Ford Foundation, EPA) regarding the paucity of scientific and demographic information in most areas of Alaska. The NOAA, responsible for project management of environmental

studies in Alaska, predicts that it will take 3 to 5 years to develop adequate baseline data in order to sufficiently predict the impacts of proposed oil and gas activity, especially those impacts related to chronic low-level pollution. The Department has taken the position that environmental studies are never really completed, and that sales should not be delayed because of incompleted studies. This conflicts with the NOAA appraisal that critical data gaps can be filled in 4 or 5 years, and at that time, sufficient information will be available to decide whether, how, and under what conditions this frontier area could be opened to leasing. Additionally, the studies that have only recently begun have not been used in the development of operating orders. The specific question posed by the State here is, " . . . at what points in the decision-making process will the environmental studies be of value, and what weight will they be given in determining . . . whether to lease, or in establishing particular operating conditions [for] operators?"

3. The third criticism of the program relates to its standing under the National Environmental Policy Act (NEPA), the OCS Lands Act, and the Endangered Species Act. Specific sections of NEPA were cited (see below) and compliance with these sections by the Department's leasing program to date were questioned.

a. "Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable or unintended consequences."

The Department's program suggests that oil and gas extraction is the primary beneficial use of the OCS, since it has embarked on a massive leasing program without considering "undesirable or unintended consequences" or without considering deferring drilling while the other uses and impacts on them are identified.

b. "Preserve important historical, cultural and natural aspects of our national heritage . . ."

If the Department proceeds with its program on its proposed timetable, numerous threatened or endangered species might be subject to impacts from oil and gas operations before we know what these impacts might be.

c. "Achieve a balance between population and resource use which would permit high standards of living and a wide sharing of life's amenities."

The State claims that the Department's lack of analysis on the relationship of 10 million acres to the country's energy needs is a deficiency.

d. "Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources."

The State also claims that the impacts of the OCS development on renewable resources are likely to be immense; however, the DES and other sources (CEQ, NOPS) note the lack of knowledge of potential impacts on commercial and sport fisheries.

The State also claims that the ". . . systematic, interdisciplinary approach . . . in decision-making . . ." required by NEPA has been ignored by the Department in not taking the recommendations made by NOAA, CEQ, NAS and EPA on Alaskan development. Further, the criteria by which the Department will balance environmental risks against resource potential have not been outlined, and the Department is making its decision without necessary data.

The Department has proceeded with plans for development in the Gulf of Alaska without identifying those methods that will be used to protect endangered species and their habitats under the Endangered Species Act of 1973. Moreover, the Department currently manages numerous Federal land withdrawals such as refuges and wilderness areas; many more are proposed. The impact statement does not address the potential conflicts between OCS development and these land withdrawals which were withdrawn specifically for their ecological value or scenic qualities.

4. Section by Section Analysis of DES 74-90

The remaining 111 pages of the State of Alaska's comments are detailed comments, criticisms, and suggestions related to specific pages or sections of the draft EIS. These are highlighted in the summary following. Many of these comments contain information provided by the State that is of such a detailed nature that it does not properly fit into a program overview type impact statement, but more properly belong in a site-specific impact statement. Where these detailed comments are provided by the State, they will be noted in the summary below. All the information provided has been transmitted to the Alaska OCS Office in Anchorage for their use and analysis in a site-specific impact statement on Gulf of Alaska development.

Volume 1 of DES 74-90

Section One

Page 9 - The lease sale in MAFLA was held before meaningful baseline data had been gathered.

Page 11 - Geological and geophysical information should be made more available to BLM and the public from USGS and industry.

Page 12 - Criticism of the bonus bidding system should be noted.

Pages 12-13 - Criticism of the lack of well-trained inspectors and supervisors within USGS leveled by GAO should be addressed.

Pages 19-28 - The Department's "two-tier" system is biased, in that industry can respond on the basis of geological, geophysical and technical knowledge, but the public can not respond because current environmental information is lacking. The State would like this option to respond, and suggests that no action be taken on calls for nominations or the leasing schedule until all environmental information [illegible] frontier areas is gathered and analyzed.

Pa[illegible]-33 - Delete two statements regarding PAD V energy surplus as inaccurate and overly general.

Page 24 - Substitute a detailed analysis of the CEQ report.

Page 27 - Resource reports come from Federal government agencies; the State government agencies do not supply them.

Pages 29-86 - Section I.C. of the EIS should supply more information on the safety record of existing OCS operations. Information from the North Sea experience should be included.

Page 31 - The exploratory drilling phase should be identified as the one of the most dangerous phases for possible blowouts.

Page 34 - What is maximum depth of risers at the present time?

Page 35 - Where are sea floor blowout preventers being used now, what are their depth limitations, advantages and disadvantages? Additionally, while USGS and USCG regulations can result in suspension of rig activity for violations, both GAO and CEQ had reservations about how this was being carried out. The CEQ report recommended that punative shut-ins would be more effective in deterring violations than the current practice of stockpiling parts to correct violations.

Pages 39-40 - How are buoyant towers kept in place, have they been used elsewhere and at what depth? CEQ reports that buoyant towers are susceptible to damage by tsunamis in the Gulf of Alaska.

Page 41 - Icing of the structure itself is also of concern in the Gulf of Alaska. Also, platforms that can withstand anticipated magnitude of earthquakes in the Gulf of Alaska have not been designed.

Page 46 - The EIS should be more specific on how often blowout preventers and other well control equipment are tested.

Page 50 - The EIS should identify those areas in the Gulf of Alaska where other resource usages would conflict with above water structures, i.e., where subsea completions would have less effect.

Page 53 - The EIS should quantify the amount of oil that could remain in formation waters after treatment. Proposed EPA standards may prohibit discharge of formation waters.

Page 54 - How many accidents have occurred and for what cause, and how much oil has been lost, during well workovers? Since USGS is considering prohibiting simultaneous well workover and production from the same platform in the Gulf of Mexico, why is this not in the proposed operating orders for the Gulf of Alaska?

Page 58 - This section does not discuss the impacts of pipelaying on wetlands, nor does it discuss coordinating the location of pipelines to minimize coastal disruption.

Page 67 - Visual inspection for pipeline leakage is not as easy in the Gulf of Alaska as it is in the Gulf of Mexico, due to less air and water traffic, and more adverse weather. The USGS proposed operating orders for the Gulf of Alaska require visual inspection of pipelines once a month.

Page 76 - The EIS should justify its assertion that offshore storage and tankers will not be required, or discuss the hazards of such operations.

Page 77 - The problem of malfunctioning control levels on skim tanks is not discussed, nor is data presented on failures of other safety features.

Pages 85-86 - There is no discussion of cleanup equipment capable of working on the high seas, nor of the logistics of fighting spills on the Alaskan coast.

Page 89 - Since the Secretary has the right (and duty) to withdraw tracts from proposed sales for environmental reasons, how can he do this without the necessary environmental information? What criteria does he use, how many tracts have been withdrawn in earlier sales and for what reasons?

Pages 91-92 - The Department should be more definitive and complete in its discussion of selection of a bidding system.

Page 96 - The State is concerned over the statement that (OCS operating) regulations (for the Gulf of Mexico) will be applied, probably with no change, to other geographic areas, implying that conditions in other areas will not be considered.

Page 97 - The EIS should discuss the degree of industry compliance with the requirement to report all spills to USGS. Also, discussion needs to be added on the volume of "intentional" discharges of formation water and their entrained oil. These chronic discharges may be the most deleterious, but the limitation of 50 ppm may be arbitrary and only reflect current technology.

Page 99 - Industry consultation on the preparation of operating orders is again criticized. Also, statements concerning the amendment to OCS Order #8 to prohibit simultaneous workover and production from the same platform appear contradictory, and are not reflected in the proposed OCS Orders for the Gulf of Alaska.

Pages 100-108 - The severe criticisms of the GAO regarding USGS enforcement should be mentioned here, as well as specific measures that USGS has instituted to improve their enforcement capabilities. GAO states that inspections have not occurred with the frequency specified in the regulations, and that USGS has no formal training program for inspectors and engineers. Other findings of GAO are presented, as well as those of the House Committee on Government Operation and NOPS, that emphasize the traditional laxity of inspection and enforcement programs within USGS, and the logistics problems. Acceleration of OCS leasing would further strain the effectiveness of these programs.

The EIS should address: 1) specific mechanisms which are or will be adopted in response to the GAO report; 2) the number of inspectors and technicians, as well as financial and logistical support, that will be given to each OCS region; 3) specific recommendations for strengthening the OCS Lands Act, creating strict liability for violations of OCS Orders and increasing fines from $2,000.

Page 115 - The jurisdictional dispute among BLM, USGS, and OPS (Office of Pipeline Safety) which may have resulted in inadequate pipeline surveillance, should be discussed in more detail, especially in updating the progress of the legal dispute.

Page 128 - The conclusion of the CEQ report on development in Alaska and the Atlantic should be more correctly paraphrased.

Pages 128-141 - Questions concerning baseline and special studies have been put forth elsewhere in the State's comments.

Pages 144-172 - The subsection on "Relationship of OCS Oil and Gas Leasing to U.S. Energy Supply," combined with the discussion on alternatives, is inadequate. Alternative sources, especially increased production via secondary and tertiary techniques, OCS timing, and energy conservation must be addressed more fully.

Section Two

Page 463 - The CEQ report presents a better discussion of seismic hazards in the Gulf of Alaska, especially on expected frequency; it should be noted.

Page 499 - Poor visibility may be a chronic problem in the Gulf of Alaska, and should be discussed regarding its impact on specific phases of operations.

Page 538 - Update table on tanner and dungeness crab at least to 1972.

Pages 539-541 - No mention is made of shellfish in the discussion of Bering Sea fisheries.

Pages 554-555 - The discussion of unique environments should include shellfish spawning areas. The EIS overemphasizes anadromous fish and their fresh/brackish environs.

Pages 556-557 - This section should contain more discussion on tsunamis, and admit that industry currently has not the technology to work in areas of significant ice problems.

Volume II

Section Two (continued)

Page 113 - The overall classification of Regions 5 and 6 is satisfactory; however, the breakdown for the Gulf of Alaska and the Aleutians is too generalized and should be amended to reflect realistic ecological relationships.

Page 123 - Expand the paragraph to include moose and elk populations, and the fur-bearing animals that are trapped for recreation and commercial purposes.

Pages 121-152 - The discussion of present socio-economic conditions does not give an accurate picture of the capacity of onshore areas to absorb OCS - induced development. Also, there is no discussion of BLM proposals for energy corridors and the conflicts with the Alaska Native Claims Settlement Act.

Page 122 - Land ownership in long stretches of the coastline is established. The EIS should indicate what lands are available for specific uses, the basis of both land tenure and physiographic constraints.

Pages 129-132 - The EIS discussion of possible impacts on ports and shipping is inadequate. Information is presented to show that present port facilities are incapable of handling the demands of full scale OCS development.

Pages 133-134 - BLM has missed the point on the role of air transportation in Alaska. Other transportation modes are not likely to develop. Air transport is only year-round mode.

Page 134 - The discussion of rail service is inadequate, and does not reflect that rail service will be of little use in developing the OCS.

Page 135 - Surface transportation will also not likely aid OCS development, without massive Federal and State expenditures.

Pages 136-138 - The discussion of commercial fisheries is too brief and generalized; information should be updated later than 1971. Ten-year averages of production should be used instead of one year's data.

Page 143 - The economic discussion is misleading. While petroleum products may be worth more than fisheries, fishery-related employment may be 5-10 times greater than petroleum. More work needs to be done by BLM regarding the structure and sensitivity of Alaska's economy.

Pages 153-155 - Information derived from the Gulf of Mexico regarding water quality and fisheries has practically no biological relevance to northern OCS areas.

Page 159 - The categories of effects of oil on organisms should be taken from a summarization cited for M. Blumer of Woods Hole. Dumping of raw sewage from platforms in Cook Inlet has not been discussed.

Section Three

Page 157 - Spilled oil may not be the most severe impact-producing result of OCS operations; chronic low-level pollution may be at least as significant and should be discussed in that light.

Page 158 - Acreage of land leased can not be equated with severity of impacts; frontier areas will be more significantly affected than the Gulf of Mexico for an equable amount of development. Also, pipeline laying activities in wetlands and submerged lands are not analogous to dredging activities; dredging is an element of these activities and has contributed to the annual loss of Louisiana wetlands.

Pages 162-199 - The discussion of impacts of hydrocarbons on aquatic biota is inconsistent and contradictory. The quotations taken from Lyle St. Amant are contradictory.

Pages 162-163 - Chronic low-level pollution will also affect plankton communities. The effects of oil under ice are inadequately considered.

Page 163 - Max Blumer and an MIT study are cited as sources for more accurate descriptions of the fates of spilled oil, especially regarding sinking and sediment entrainment.

Page 164 - Evidence is presented regarding the possibility of oil entering marine food chains.

Page 173 - Evidence is presented to refute the statement that nekton can avoid locally adverse conditions. Effects on life stages other than adult must be considered, as well as chronic low level pollution.

Page 175 - The negligibility of impacts on marine mammals is disputed. Possible contamination of migration routes, food sources, or breeding areas could be very serious to mammal populations. Sea otters, a threatened species, are nearly always killed by contact with spilled oil.

Pages 180-183 - The discussion of impacts on oceanic birds is totally inadequate for Alaskan waters. An unfortunately timed oil spill could result in the extinction of certain species. Long term depletion of sea bird populations could have serious consequences on the long term productivity of marine ecosystems.

Page 187 - There is insufficient basis for claiming that most marine benthic life doesn't sustain direct impacts from spilled oil.

Pages 194-200 - The impacts of dredging and pipelaying on bays, estuaries and wetlands should be discussed, not just oil pollution impacts.

Pages 219-249 - CEQ guidelines are cited regarding the necessity of an EIS addressing theprimary and secondary effects of the proposal, including socio-economic impacts. Several documents are cited for methodologies for this analysis, including the Louisiana and Texas studies showing net economic disbenefits from OCS activities. Documents related to Alaska's experience with proposed Lost River development are cited as presenting valuable information concerning the constraints on and impacts of large-scale development in rural Alaska. It is suggested that these analyses be included in a final EIS.

The next 20 pages of the State's comments are a compilation of data on the Alaskan economy and the effects of North Sea development on Scotland; the Scotland experience is analogized to the possible effects on Alaska. The information is generally along the lines of employment needs, land development, community infrastructure stresses, and transportation constraints.

Pages 250-254 - The subsection on aggregate and cumulative impacts does not discuss chronic pollution, drilling muds, formation waters and chemicals used during drilling. Concern is also expressed regarding the State's ability to control pipeline access when coastal zone management plans and mechanisms of implementation have not been developed. Baseline studies of effects of pipelaying in wetlands are necessary before the State can make full-knowledge decisions.

Page 258 - Chronic low-level pollution and increased ship traffic around and between rigs and shore should also be addressed as affecting sport fishing. Numerous fish species in Alaska are both sport and commercial fisheries.

Page 259 - The specific steps the Department will take to protect endangered or threatened species are not delineated, but some species could possibly be extinguished.

Pages 260-262 - The subject of emissions from refineries and their relationship to regional air quality and the National goal of avoiding deterioration in pristine areas is not discussed.

Pages 262-265 - The discussion of impacts on water quality is incomplete, lacking treatment of discharges of formation waters, raw sewage, and drilling fluids, of pipeline construction, and of tanker ballasting.

Page 265 - The State agrees with the statement that aggregate and cumulative effects on air and water quality are impossible to estimate, especially before baseline and monitoring studies.

Pages 269-273 - This section on impacts on fisheries overlooks the primary socio-economic impact on the fishing industry. The physical area that rigs occupy is not the effective area of removal, which would be larger due to traffic of rig-tending vessels.

Pages 284-285 - Certain statements concerning the role of environmental studies appear contradictory. On page 285, it says "Baseline studies must precede leasing for validity." However, baseline information in most areas, including the Gulf of Alaska, will not be available at the times the Department is planning on making decision concerning lease sales.

Pages 285-286 - The EIS should give more specific projections on necessary levels of manpower for inspection and supervision of an accelerated OCS leasing program.

Section Four

Pages 287-303 - Ten mitigating measures are recommended for inclusion in the final EIS. They are summarized below.

1. USGS should establish stringent Federal standards for critical OCS operator personnel and certify or provide for accreditation of training programs.

2. No drilling should be allowed in frontier areas until industry develops the technology to adequately gauge down-hole pressure.

3. Fixed platforms for exploration should be specifically banned for the Gulf of Alaska.

4. Ocean disposal of drilling muds, cuttings, sewage, production water or deck drain water with oil residues should be prohibited.

5. Best demonstrated environmental control technology should be employed in all phases of operations.

6. Subsea completions should be mandatory in the Gulf of Alaska.

7. Through cognizant tract selection, platforms should not be located where they may pose a measureable threat to endangered or threatened species, important spawning and breeding areas, key scenic and recreational areas, and important areas of renewable resources use such as commercial or sport fishing.

8. Simultaneous drilling and workover operations from the same platform should be prohibited.

9. Pipeline corridor considerations should be based on assurances that installation and maintenance will not have a measureable impact on estuaries, wetlands, or other biologically productive areas.

10. Offshore storage facilities should be prohibited in areas which pose weather or seismic risk, such as the Gulf of Alaska.

Additionally the final EIS should discuss those mitigating measures found in Chapter 8 of the CEQ report.

Pages 304-316 - This section regarding "Unavoidable Adverse Environmental Effects "does not contain several adverse effects, most of which were mentioned earlier in the State's comments. Specifically, this section should address: chronic low level pollution caused by "intentional" discharges; the impacts to wetlands and beaches of pipelines and onshore facilities; impacts on Indian, Aleut, and Eskimo communities and culture caused by a large influx of personnel, materials and support facilities; conflicts with present land uses, especially those lands that contribute to the maintenance of renewable resources.

There are also some impacts identified in this section as unavoidable that are indeed avoidable. These could be avoided by applying levels of technology recommended by CEQ and EPA. These include: banning discharges of drilling muds and cuttings, as well as formation waters; strict stipulations on right-of-way permits for pipelines, and permit systems for air quality deterioration from onshore facilities.

Section Eight

Pages 324-332 - The section on alternative lease sale scheduling should be thoroughly revised to include the tentative schedule published in November, 1974 and to then analyze relative impacts, timing and availability of estimated resources, responsiveness to regional demand markets and current level of technology.

Pages 333-338 - Alternatives B and C have little analytical value until the benefits and necessity of leasing 10 million acres have not been identified.

Page 338 - Sufficient information is not available to make the statement that ". . . basically safe technology is available . . ." The CEQ report and the NAS critique of the report, NOAA, and EPA are cited regarding the lack of information and disputing this contention.

Pages 339-340 - Contradictory statements in the draft EIS regarding the role of baseline studies in lease sale decisionmaking are indicated.

Page 341 - The entire program of accelerated OCS development, and the Department of Interior, is criticized for devoting too little effort to interfacing with the Coastal Zone Management Act of 1972 and the coastal zone plans being developed by the States. The Department and the EIS summarily dismiss the option of deferring leasing in frontier areas until States have completed this planning. Several sources are cited (GAO, NOAA, NOPS) regarding the potentially massive impacts that would affect the coastal zone; these sources generally concur that OCS leasing in frontier areas should be delayed until coastal zone plans for the area in question are developed.

Pages 341-342 - A more definitive response to criticisms regarding BLM and USGS capabilities to manage and supervise OCS development is required for the reviewing public.

Pages 345-346 - The discussion of a possible discontinuance of OCS leasing is of little analytical value, since the environmental impacts of such an alternative can not be gauged against the proposal. A matrix should be constructed for all alternative energy sources and the impacts of acquisition in the final EIS.

Pages 347-409 - The next 23 pages of the State's comments contain an analysis of various alternative energy sources, including supply and demand forecasts for Alaska and the western states. The alternatives discussed by the State include: conservation, hydroeletric power, geothermal energy, synthetic natural gas and oil production, and oil shale production. The general conclusion is that many, if not all, of these alternatives could substitute for increased OCS production, even in the near term. However, the environmental impacts of each alternative's development was not discussed in detail; instead, it was recommended that the studies be initiated by the Federal Government on all these alternatives.

Some introductory remarks preceded the discussion of alternatives. The State recommended that an additional alternative, secondary and tertiary recovery, be included in the final EIS. The State claims that the pertinent question regarding energy alternatives is whether there are alternatives which could be utilized in the near future, and what effects these alternatives would have on the Nation's need to develop OCS petroleum resources. The EIS addresses present development trends, but does not discuss the economics and environmental costs of accelerating alternate energy development.

Pages 410-413 - Public availability of geological and geophysical information would significantly aid decisionmaking regarding any and all proposed lease sales. Federal Government sponsored exploratory drilling should be considered as a means of obtaining such information, and discussed in more detail in the EIS.

Pages 414-416 - The bonus bidding system, which entails large capital outlays at the beginning of regional development, significantly lessens the possibility of closing an area to development or curtailing operations due to identified environmental degradation.

Page 421 - There is a potential for conflict of interest that is not mitigated by EIS dissemination to many reviewing agencies; lead agencies in EIS preparation have wide latitude regarding structuring and content of the EIS. The Department of the Interior must recognize that this proposal may be one of the most complex and significant Federal actions yet undertaken, and true interagency coordination must be attained. The State recommends that NOAA prepare the impact statements on accelerated OCS leasing, along with NAS and EPA. The EIS should then be reviewed by CEQ. The credibility of CEQ is higher than Interior, and the CEQ report of April, 1974, was a far superior environmental analysis than DES 74-90.

The EIS omits several managerial alternatives which should be included in a revised draft EIS:

1) Defer accelerated leasing until Congress acts on an OCS oil and gas revenue sharing proposal.

2) Abandon the "leasing" system and substitute a licensing system that prescribes full development plans (offshore and onshore) prior to licensing. Licenses would be awarded to developers with the best environmental control technology and advanced planning for mitigating impacts.

3) Revise the OCS Lands Act to provide more efficient and meaningful enforcement of statutes, regulations, orders and development plans, along with liability provisions for non-compliance.

4) The Department should recommend legislation that would give coastal States veto power over OCS development off their coasts.

Pages 425-426 - The Department's position regarding the economics of requiring "best demonstrated environmental control technology" is severely criticized. This violates NEPA regarding the contemporaneously derived evaluations of economic and technical considerations. No information is presented regarding the "economics" of requiring this provision. The NAS is quoted from its critique of the CEQ report, indicating its position that, where costs of environmental protection override the economic resource value, resources should be developed elsewhere until either the necessary technology becomes less expensive, or the resource significantly increases in value.

The following is the final paragraph of the State of Alaska's comments.

> "In conclusion, the draft environmental impact statement is seriously flawed. It provides no information for the public or the State to evaluate the soundness of the program. In its present form it in no way complies with the requirements of NEPA and it seems to be in violation of other Federal statutes such as the Endangered Species Act. In order to provide the public with a true opportunity to review Federal decision-making related to this major project, the draft should be rewritten and then circulated again as a draft."

Disposition

It should be fairly obvious from the previous summary that the State of Alaska submitted detailed and substantive comments regarding the proposed acceleration of OCS oil and gas leasing. Several points should be made that apply in general to Alaska's comments and other comments. First, a programmatic overview type impact statement does not attempt to address in detail all the various environmental costs and benefits that will ensue from adoption of a program. The OCS leasing program, while a complex set of interrelated environmental, economic, and technical parameters, nevertheless can be separated into a set of identifiable program elements, viz., individual lease sales in different geographic regions. Detailed assessment of the environmental considerations of each of these elements has been the Department's position at all times, through continued commitment in this matter. Comments regarding a detailed, complex reaction to OCS leasing may receive Departmental responses that are cursory; however, this is only because the problem appears to the Department to be one that is more properly the purview of a site-specific impact statement. Such denotation in this EIS alerts site-specific EIS preparers to considerations that are of major concern at the local level.

The format for the responses to the Alaska comments will be the same as the summary presented on the previous pages, which was basically the same as the State's original comments.

Timing

1. The Department has modified the goal of the OCS program from leasing ten million acres in 1975, to holding six proposed lease sales in 1975 and six possible lease sales per year for the period 1976 through 1978, offering prospects in each frontier area by the end of 1978 (Section I.A.). A proposed lease sale refers to a tentative sale for which tract selections have been made for the purpose of preparing a site-specific EIS. A possible lease sale refers to a tentative sale which has been listed on the proposed planning schedule in Section I.A. but for which tract selections have either not been made or tracts have not been nominated. A frontier area of the OCS is one which has experienced little or no oil and gas development. Accelerated leasing remains an integral part of the proposal, but a specific acreage figure has been eliminated. Regarding concession and implementation of the program, it should be noted that President Ford announced at a meeting of Coastal States Governors on November 13, 1974 that he was not wedded to a ten million acre goal for the leasing program.

The proposed four-year planning schedule issued in November, 1974 (updated in June, 1975) was adopted as the basis of the modified OCS program proposal. Such a document is essential in enabling the Department to proceed in an orderly and timely fashion with consideration of proposed and possible lease sales. The schedule aids the Department in establishing the order in which areas will be examined and in planning work assignments of personnel and the allocation of resources for the environmental and socio-economic information gathering process. The planning schedule also serves to apprise Federal, State, and local agencies, industry, and the public of the time frame for potential leasing. The schedule is subject to revision at any time, and does not constitute a decision to lease in any area. The consideration of any proposed or possible sale may be terminated, modified, deferred or advanced at any time.

2. a. Baseline studies in fiscal year 1975 (ca. $25 million) represented 40% of the OCS program budget. In fiscal year 1976, over half the budget ($99 million) is earmarked for baseline, monitoring, and special studies. An operating budget also includes salaries, travel, supplies, and printing costs of personnel involved in environmental assessment (impact statement preparation and studies program coordination), resource assessment (establishing fair market value of resources before they are auctioned) and the administrative details of conducting lease sales. Budget requests must include

funding for possible levels of activity for the succeeding year; if accelerated leasing is undertaken, these monies must be available. While studies program money will almost certainly be completely used, the remainder of the budget request will be spent depending on the level of activity that is decided upon, i.e. how much, if any, accelerated leasing will be undertaken. Much of the monetary allocations are directed at supervision of past actions (i.e., previous sales) that have accelerated to some degree in the past few years.

b. The Court, in People of the State of California ex rel. v. Morton, et al. ruled adversely on plaintiffs' request for injunctive relief based on, inter alia, the claim that an EIS should have been prepared at the time of any recommendation to the President relative to the Energy Message of January 23, 1974. Prior to any implementation of the proposed accelerated program, the Department publicly announced on May 20, 1974, that it intended to prepare a programmatic EIS concerning the proposal, fully one year, at a minimum, before any accelerated leasing would have been possible.

c. The Department generally conveys its program proposals via the lease sale planning schedules. Subsequently, a variety of opportunities are open to States to express their concerns. For instance, on February 20, 1974, (see Federal Register that day) shortly after the President's Energy Message, the Department requested the advice of Federal, State, and local agencies, the public and industry concerning the environmenta, technical, and economic aspects of potential OCS leasing in all OCS areas. The report of responses is found as Attachment F. Such requests have preceded, or will precede by several months, Departmental field recommendations on tract to be subjected to additional environmental analysis in a site-specific EIS.

d. See last paragraph of disposition comment number 1, above.

e. Comments suggesting that the Secretary or the Department is committed to leasing ten million acres in 1975 are refuted by the fact that the Department has eliminated that acreage figure as a goal of the program. Statements made by a Departmental official, at a time when the goal of the program was to lease ten million acres, calling for lease sales in the Atlantic and Alaska, mean precisely what they say. When the goal was to lease ten million acres, any plan to meet the proposal would have to offer sufficient acreage to meet the goal. The tentative nature of planning schedules is shown by the fact that the possible mid-Atlantic sale has been eliminated from consideration for calendar year 1975.

f. The previous response also applies here. Additionally, the Department has believed for some time that, in considering the possibility of leasing in OCS areas with no prior history of Federal leasing, every effort should be made to inform State officials, local officials, and the general public about the purposes of the OCS program proposal and the procedures to be followed by the Department in considering specific sale proposals. The Department launched an extensive effort to inform officials and the public concerning the southern California sale proposal. The Department intends to follow this practice in other frontier areas.

g. The Department believes that operating orders should be developed for frontier areas in a timely fashion so that they may be evaluated during consideration of any sale proposal for that area. Such orders can and will be amended or modified at any time information from any source becomes available which warrants a change. If such information becomes available after a lease sale, existing leases would be governed by amended or modified orders. Comments have been requested of all parties on the proposed operating orders for the Gulf of Alaska (Federal Register, January 6, 1975).

Draft operating orders were not submitted to industry; this is no longer the policy of USGS. The State is apparently mistaken in its claim. In August, 1974, the USGS requested recommended operating orders from all sources for the Gulf of Alaska under several headings. From the responses received (the "oil industry comments to prior drafts"), the USGS published the proposed operating orders (the so-called "final drafts") on January 6, 1975 for public review and comments.

h. Rogers Morton is no longer Secretary of the Interior; the oil industry has not been turned loose over all outdoors.

The Department either has initiated, or is in the process of initiating, benchmark environmental studies in all frontier areas where OCS leasing may be considered (see Section I.D.). However, these studies are not specifically designed to predict the impacts of OCS operations in the area, but rather to present a current assessment of those measurable parameters that can be measured again after development begins. Some of the information generated by benchmark studies will be utilized in tract selection and EIS preparation will generally be based on existing information. This position was upheld as a reasonable approach in the MAFLA area, Sierra Club v. Morton (5th Circuit Court, 1975).

In the event a lease sale were held prior to completion of baseline studies, the Department still does not lose control over the operations simply because of lease issuance. In the South Texas area, leases were issued that contained a stipulation barring certain operations near some topographic highs that may have reefs, and do have sizable concentrations of snappers and groupers that are harvested in commercial quantities. Refinement of the stipulation is awaiting the results of benchmark investigations in that area.

Detailed plans for development must be approved by USGS before any development can commence. The USGS is empowered to shut down operations on any leas, or issue notices to operators, when public safety and public resources are in jeopardy. As such, benchmark and monitoring information can modify operations after lease issuance. The Secretary, too, can halt development for environmental reasons, as was done following the Santa Barbara blowout.

Scope and Direction of the EIS

Paragraph 1 - The November, 1974 planning schedule has been updated (June, 1974). This schedule is the basic proposal outlined in Section I, Description of the Proposal, and is the basis for the environmental impact analysis. Descriptions of all the OCS areas are presented in Section II, region-by-region impact assessment is performed in Section III, and alternative lease sale scheduling, both in sale sequencing and total time frames, is presented in Section VIII.

Paragraph 3 - With respect to a proposed sale in the Gulf of Alaska, no decision will be made by the Secretary until he has considered and evaluated this program EIS and other studies such as the CEQ report. If he should decide to adopt an accelerated leasing program that included a proposed sale in the Gulf of Alaska, he would then be required to consider and evaluate a site-specific EIS for that proposal before making a decision as to whetner or not to hold the proposed sale and in what form.

Paragraphs 4 and 5 - The environmental assessment made by CEQ is discussed in this EIS, and will be further addressed in any site-specific EIS that would be prepared on the areas CEQ covered. Any contention that the CEQ assessment will not be considered is unfounded. Furthermore, events have indicated that NOAA's analysis of the program proposal in relation to CEQ assessment is fallacious. Following a sooner-than-expected ruling from the Supreme Court regarding ownership of the Atlantic OCS, the Department can still not consider a lease sale in the Atlantic until 1976, given the lead time of over a year for tract selection, draft EIS, putlic hearings, final EIS, d cision, and sale (if the decision is to proceed in some fashion). The Department was bound to abiding by the Supreme Court decision and could take no steps toward eventual leasing in the Atlantic until the case was adjudicated. Under a proposed program of leasing ten million acres in 1975, all OCS areas aside from the Atlantic had to be considered as possible lease areas. The elimination of the ten million acre goal obviates this consideration to some degree.

Analysis of the Impact Statement DES 74-90

The three generic criticisms are addressed first

1. The role of OCS oil and gas in the National energy supply picture is portrayed on the basis of the Project Independence report of business as usual and accelerated development scenarios. In addition, The Ford Foundation Energy Policy Project report A Time To Choose is more heavily relied upon for the relationship between energy supply and conservation strategies. The recently

published University of Oklahoma study of energy sources and the environmental impacts of their development (based in large part on Hittman Associates (1974) is also utilized to a large extent to determine energy supply possibilities in the near and long term.

The relationship between energy conservation and accelerated OCS development is explicity made by assuming no development and a forced conservation strategy because of non-replacement of OCS resouces. The costs as well as benefits of such a scenario are examined. Also, the energy self-sufficiency of the PAD V market is open to serious quenstion, especially in the near term. However, the potential National benefits of a regional surplus and possibility of exporting are addressed under Section VIII on Alternatives.

Although there are long lead times to development in Alaska, oil and gas development, along with coal, remain the single most accessible energy sources at the for domestic supply. Longer lead times dictate that the environmental consequences of development be examined at an early stage, so that production, if deemed necessary, can be accomplished in areas of lower environmental risk, or intensive efforts can be initiated to mitigate the possible impacts in areas of high environmental risk/value.

2. While NOAA may very well be correct in stating that it would take four to five years to gather and analyze sufficient information to predict the impacts of OCS development, predicition is not the purpose behind the environmental studies program which NOAA is conducting in Alaska for BLM. The basic goal is to establish the range of impacts through a process of base case (baseline) identification and monitoring after development to determine the changes that development per se induces. Mitigation of potential impacts could result from baseline studies through identification of areas of specific geologic hazard or unique features. Special stipulations of development could be placed on leases before a lease sale, and notices to operators could be developed (or operating orders amended) if hazards are identified after a lease sale. To the degree possible, baseline information will be incorporated into tract selection, EIS preparation, and development of operating orders and special stipulations. However, they are not designed for decision-making or how, when, or if to lease. This is particularly apparent in the claim made by NOAA concerning chronic pollution.

3. The final program EIS is prepared with full knowledge of the requirements of NEPA, the OCS Lands Act, and the Endangered Species Act. NEPA requires that the environmental consequences of the

action be examined, appropriate mitigation of impacts be employed, and alternatives to the program be examined. The OCS Lands Act basically establishes U.S. ownership and jurisdiction of the OCS, prescribes the manner in which the Secretary of the Interior as overseer of resource development on the OCS may determine the regulations under which lands are leased for mineral development, and allows the Secretary to amend regulations to prevent waste and conserve the resources to the necessary extent. The Endangered Species Act prohibits certain actions related to endangered species (import/export, killing, selling etc.) and directs all Federal agencies to prevent impacts on habitats that may be critical to endangered species' survival. Each of these pieces of legislation is discussed in various sections of the EIS.

a. The Department supports the multiple use concept regarding the resources of the OCS (mineral and renewable). The "massive leasing program" as proposed in a series of discrete actions that are reviewed and analyzed for their environmental and economic consequences, and their relation to other uses of the OCS. The review process, especially as it relates to this EIS, allows for identification of other uses (public hearings, comments on draft EIS); this allows discussion in the final EIS of all potential significant impacts of the proposal.

b. The final EIS discusses all the potential impacts on threatened or endangered species, although quantification or probability of potential impacts can not be accomplished with any degree of precision.

c. Accelerated OCS development and its relationship to National energy supply is examined from the basis of the Project Independence document, as well as the Ford Foundation's A Time To Choose and the University of Oklahoma study on energy sources.

d. While knowledge of direct or indirect effects of OCS operations on commercial or sport fisheries may be somewhat lacking, the possibility of immense impact is raised in the EIS. Gross effects on these renewable resources, when observed, would be just cause for the Secretary to halt operations in the affected area. To date, no such gross effects have ever been observed on fisheries that would warrant such an action.

The Department has considered the recommendations of NOAA, CEQ, NAS, and EPA, and discusses these reports in the final EIS. In most cases, the Department agrees with the conclusions, especially with the general conclusion that OCS operations in most areas of Alaska are of high environmental hazard, and beyond the scope of present technology in some cases. The EIS process is designed for presentation of environmental and socio-economic impacts to decision-makers for the appropriate weighing of advantages and disadvantages of the proposal with economic and technical information developed elsewhere.

Endangered and threatened species are identified in each of the geographic regions in Section II and potential impacts are discussed in SectionIII. The current implementation of the Act within the Federal Government as it could relate to OCS development is a multi-agency effort for identification of critical habitats for endangered species. Concomitant with these identifications is an effort to promulgate regulations regarding the kinds of activities that would be specifically prohibited within and at various distances from these habitats. Other aspects of the Act such as importing and exporting, killing, and selling have already been implemented. Federal land withdrawals are subject to a wide range of regulation and prohibition of different activites. These are briefly addressed in Section I on Management Aspects.

Section by Section Analysis of DES 74-90

Comments by the State of Alaska that relate to factual errors, or suggested inclusions which the Department accepts, will be simply denoted as "Editorial"; this indicates that the correction has been made. Other comments are responded to in more detail, where disagreement exists. Format is by page number in the EIS, similar to the summary of comments.

Page 9 - This statement has been added.

Page 11 - A draft EIS on proposed regulations concerning geological and geophysical (G&G) data acquisition and disclosure was made public on April 16, 1975. The proposed regulations were published at the same time in the Federal Register and public comment was requested. The proposed regulations include a permit system whereby all parties (except scientific) wishing to conduct G & G operations must apply for and receive a permit from USGS on the specific data collection. All G&G data, interpretations, and maps collected pursuant to the regulations can be requested by the Director of USGS. BLM and other agencies are to be made public on a more rapid turnaround basis than has been the case in the past.

Page 12 - Alternative bidding systems are discussed.

Pages 12-13 - The Department contends that inspectors and supervisors are competent individuals. New employees are essentially broken in through on-the-job-training, afte[illegible]amiliarization course of training. The number of inspectors and supervisors that will be assigned to each area is obviously contingent upon decisions to hold sales in any or all areas (decisions which have not yet been made) and the intensity of exploration and degree of development. With so many variables, the absolute numbers of inspectors and supervisors for each frontier region can not be estimated; only the overall manpower can be estimated, and even that rather crudely.

Pages 19-28 - The difficulty in responding to the two-tier system concerning environmental information is appreciated. It is the Department's feeling that, in many areas, current environmental information is available or, at the very least, unique features of different areas were known. To the degree that it was possible for this environmental information to be portrayed, the Department wanted to allow this opportunity for portrayal. The State and any other groups can always respond to calls for nominations (even if it is a nomination for exclusion). Finally, waiting for large amounts of environmental data which the Department is gathering is not appropriate for several reasons. First, the environmental studies program is constrained by time and money to focus on those aspects of the environment that would permit measurement of changing conditions. All aspects of the environment in the different areas are not being studied. Second, the baseline portion of the studies program will have limited predictive value, as it is designed to survey existing conditions. Third, existing information in many areas is sufficient to perform an environmental assessment of the significant resources that might be affected.

Pages 22-23 - Editorial.

Page 24 - The CEQ report is discussed and utilized in many sections of the final EIS.

Page 27 - Editorial.

Pages 29-86 - Additional data on the safety of various operations is supplied in relation to the succeeding points. Some information from the North Sea experience is provided; however, information of safety records is difficult to come by, as environmental controls are not as strict over there as here.

Page 31 - Editorial.

Page 34 - Maximum depth of risers in use now is about 2300 feet.

Page 35 - Seafloor blowout preventers are used whenever drilling is done by drillship or semi-submersible. Their use is limited only by the current maximum drilling depth of risers, about 2300 feet. They are advantageous for stopping blowouts, should the riser break. The CEQ recommendation is still undergoing review within USGS.

Pages 39-40 - Buoyant towers are designed to be kept in place by a redundant system of chains and anchors. They are currently not being used on the U.S. OCS, and perhaps not anywhere at this time.

Page 41 - Editorial.

Page 46 - See the Operating Orders for the appropriate geographic region (Gulf of Mexico, Pacific, or proposed for Gulf of Alaska).

Page 50 - Most areas of the Gulf of Alaska would benefit at least marginally from a requirement of subsea completions; the marginal benefit comes from decreased interference with certain types of fishing operations. Of course, subsea completions still provide a hazard to bottom trawl fishing operations.

Page 53 - This operation represents a chronic discharge of oil into the ocean; under the 50 ppm maximum average of entrained oil, different figures are developed for different areas as to what load in barrels this chronic discharge means in the environment.

Page 54 - The two major accidents associated with well-workovers were the Shell and Chevron accidents in the Gulf of Mexico. These are mentioned in the EIS. The USGS has not yet determined that simultaneous production and workover should be prohibited, and thus has not proposed this action for Gulf of Alaska operating orders.

Page 58 - Impacts are discussed in Section II, mitigation in Section IV.

Page 67 - Editorial

Page 76 - Offshore storage and tankers may be required in some areas; the hazards are discussed in Section III on Impacts.

Page 77 - This reference to problems in Cook Inlet could not be located. CEQ recommends that environmental loadings in Alaska be kept to the absolute minimum with appropriate regulations.

Pages 85-86 - Oil spill containment capabilities in the Gulf of Alaska will be discussed in a site-specific EIS for that area.

Page 89 - The Secretary has a large wealth of environmental information and expertise in various offices of the Department. Many problem areas are identified by insuring full awareness within the appropriate offices of actions such as proposed OCS lease sales. In recent times, a large block of tracts in the NE Gulf of Mexico were removed from the MAFLA lease sale (1973) for defense purposes. The 1974 offshore Louisiana sale had 12 tracts removed when USGS filed an alert regarding bottom instability in the area. Tracts have also been removed that might have caused potential interference with shipping lanes. These should serve as indicators of the Department's ability, and intention, through its own internal expertise and from outside data sources such as public hearings and comments on sale proposals, to evaluate, tracts for inclusion or exclusion.

Pages 91-92 - Alternative bidding systems, as they relate to different environmental impacts, are discussed in Section VIII.

Page 96 - The regulations have remained essentially the same since the enactment of the OCS Lands Act in 1953. It is the operating orders that are developed for each region that take into account the unique problems and mitigation of some in each area selected for analysis of benefits and costs of development.

Page 97 - No information could be obtained regarding the degree of industry compliance with spill reporting requirements. Coast Guard reports of spills are checked against reported spills, but there is no one-to-one correspondence. This is understandable because spills could emanate from sources other than platforms and drilling rigs, such as tankers and other vessels, and natural seeps. This makes investigation of compliance a difficult problem.

Intentional or operational discharges are quantified in Section III on the basis of oil throughput and average percentage of water in the crude oil produced in the Gulf of Mexico.

Page 99 - See the earlier response under Timing, 2.g. Additionally, a decision has not yet been reached on whether to propose such an amendment, and thus it is not found in the proposed operating orders for the Gulf of Alaska.

Pages 100-108 - The USGS has increased its budget and manpower requests are appropriate to immediate tasks. However, long range estimates of numbers of inspectors, engineers and supervisors are difficult to make because of the unknowns mentioned in response to pages 12-13. Manpower needs will be adjusted with each fiscal year budget request (and supplementals as the need dictates). The USGS has been directed to investigate the feasibility of a formal training program, and evaluate if this would be any more effective than a familiarization coures and on the job training.

The Oil Spill Liability Contingency Fund, to be kept at a level of $200 million, is included in current proposed amendments to the OCS Lands Act now in Congress.

Page 115 - It is difficult to chart the progress of an administrative/jurisdictional action. Contact with appropriate parties within USGS and Office of Pipeline Safety (OPS) has indicated that both agencies, in coordination with BLM, are attempting to establish a single set of regulations that will cover all aspects of pipeline design and materials, routing, metering of flow, type and frequency of placement of flow safety devices, and pipeline burial. No anticipated date for the proposed regulations was given.

Page 128 - Editorial

Pages 128-141 - No comment necessary; points addressed elsewhere.

Pages 144-172 - The relationship of OCS oil and gas (present and anticipated) in the U.S. energy supply picture has been more fully integrated as part and parcel of the proposal. Project

Independence data are included regarding the potential of the OCS under the business-as-usual and accelerated development conditions. The full range of energy alternatives is presented in Section VIII, with their concomitant relative impacts.

Page 463 - The discussion of seismicity in the Gulf of Alaska has been revised, utilizing additional information including the CEQ report. This is again treated in Section III on Impacts, under Natural Hazards analysis.

Page 499 - Editorial

Page 538 - Editorial

Pages 539-541 - Editorial

Pages 554-555 - Editorial

Pages 556-557 - Tsunamis are discussed in Section III as a natural hazard to development. Also in that section, the problems of ice and the current inability of technology to cope with it are discussed.

Volume

Page 113 - This discussion is based on McRay, et. al. (1969). This paper is an extensive discussion of Alaskan ecosystems, and it is felt that the McRay characterizations should not be challenged on the basis of a one paragraph recommendation by the State of Alaska that contains no references.

Page 123 - These data are more appropriately discussed in a site-specific impact statement.

Pages 121-152 - The programmatic EIS attempts to give a generalized picture of socio-economic conditions in all the areas of the U.S. that could be affected by OCS development. Impacts are discussed in a generic fashion in Section III; however, more detailed descriptions and anticipated impacts will be discussed in site-specific impact statements. This response applies to succeeding comments up through page 143, except that data on commercial fisheries have been revised.

Pages 122, 129-132, 133-134, 134, 135, 136-138, 143 - See previous response.

Pages 153-155 - Editorial.

Page 159 - Editorial; sewage discharges are discussed in generic impacts, Section III.

Page 157 - Chronic pollution may in fact be the least as significant as oil spills as a pathway for pollutants to enter the marine ecosystem. The emphasis of the final EIS has been changed to reflect this possibility and to identify the sources and magnitudes of such chronic operational discharges.

Page 158 - Specific acreage targets, either for individual sales or the total acreage, have been eliminated from the proposed program. Couching the proposal in terms of a certain number of sales per year for four years dictates that the Department examine in overview the relative impacts of leasing in various areas. This is accomplished by examining the risks of development in each area, depicting the resources of each area, and suggesting alternative leasing strategies. Impact risk is analyzed in part by relating the increased risk of natural hazards in other areas compared to the relatively non-hazardous conditions in the Gulf of Mexico.

Dredging is a component of pipelaying in wetlands; the EIS has been revised on this point.

Pages 162-199 - Some revision has been made in this set of pages' see the individual responses that follow. St. Amant's quotations have either been deleted or more fully explained.

Pages 162-163 - The effects of chronic pollution are more completely discussed. Special reference is also made to the generally unknown nature of the effects of oil under ice.

Page 163 - These sources are included in the discussion on the fate of spilled oil.

Page 164 - The statement referred to only relates to the lack of evidence that oil can enter the food chain at the phytoplankton level; other transfers through ingestion of prey are possible.

Page 173 - The additional effects on younger life stages, as well as the effects on all stages of substances that may not be sensed, have been added in the generic discussion, Section III.

Page 175 - This discussion has been expanded in Section III, Generic Impacts.

Pages 180-183 - This discussion, too, has been upgraded.

Page 187 - The caveat of lack of information has been added to the discussion on impacts to benthic life. Most knowlege centers around the impacts to shallow and intertidal benthos, which do suffer direct impacts.

Pages 194-200 - This discussion is found in Section III on Impacts.

Pages 219-249 - Socio-economic impacts are indeed an important component of the NEPA mandate. What is also apparent is that a programmatic impact statement on accelerated OCS oil and gas development cannot attempt to address in complete detail the entire range of socio-economic impacts in all the regions that are included in the proposal. This is one of the primary reasons the Department has committed itself to individual site-specific impact statements on each sale that might be proposed. The amount of anticipated development can be focused upon in much more detail when individual tracts are identified, the extent of resources can be estimated, the intensity and ramifications of development can be more adequately gauged, and the regional nature of impacts, especially for an initial proposal in an area, can be more easily bounded. The proposal at hand is essentially one which asks whether additional environmental and socio-economic analysis should be undertaken in various OCS areas, in what sequence, and in what time period. As such, it presents an overview of environmental and socio-economic conditions in all areas, the general consequences of certain levels of development, and alternative strategies which might be employed. The data presented by the State are quite detailed, and inappropriate for the scope of this EIS. They have been forwarded to the Anchorage Office for aid in preparation of a site-specific EIS.

The studies of the socio-economic costs to the States of Louisiana and Texas are presented and critically reviewed.

Pages 250-254 - Aggregate impacts of chronic pollution, drilling muds, formation waters, and drilling chemicals are addressed as generic impacts in Section III. Regardless of whether a State has a coastal zone management plan, we feel all States still have effective veto power over developments such as pipelines crossing shoreline. Baseline studies merely assess current conditions; the proper way of studying effects of pipelines on wetlands is to look at historical examples, e.g., the Louisiana marshes. The State should have adequate information on its own wetlands simply from on-going studies, such as coastal zone management planning studies.

Page 258 - Editorial.

Page 259 - The method of implementation of the Endangered Species Act is still being developed by appropriate Federal and State agencies, of which Interior is one. Aside from the current lists of threatened and endangered species, the status of implementation is the identification of critical habitats for each species. The Department will comply with the regulations that are developed. At this point, however, it is impossible to say what this compliance will entail. The Department is aware that any impacts on, most particularly extinction of, endangered species can not be condoned. Potential impacts on threatened and endangered species are addressed in Section III; possible mitigation is addressed in Section IV.

Pages 260-262 - These subjects are discussed under generic impacts in Section III.

Pages 262-265 - See previous response.

Page 265 - No comment is necessary.

Pages 269-273 - Socio-economic impacts and physical area removal by rig activity are now discussed generally.

Pages 284-285 - This is an apparent miswording. Baseline studies must precede development in order to compile a valid picture of environmental conditions prior to events which could alter these conditions. Within the constraints of time and money, baseline studies are initiated as far ahead of proposed leasing as possible. Leasing has been permitted in two areas (MAFLA and South Texas) before baseline sampling was completed; as long as the sampling is completed before development commences, the analysis and assessment of predrilling conditions can be completed elsewhere at a later time.

Pages 285-286 - See response to Alaska comment, Vol. 1, pages 12-13.

Pages 287-303 - The recommended mitigating measures have been included in the final EIS; they are identified as State of Alaska recommendations. The mitigating measures of the CEQ report are also included.

Pages 304-316 - Many of these impacts are now addressed in Section V of the final EIS. The State claims that some impacts listed as unavoidable are avoidable through the application of certain recommended measures. While this statement could be made concerning numerous aspects of operations, analysis of such recommendations must consider the actual or potential magnitude and duration of such impacts, and temper these with the economic considerations of large expenses for negligible environmental gains.

Pages 324-332 - This is the proposed program as outlined in Section I, only the June, 1975 revised and updated schedule is used.

Pages 333-338 - The ten million acre target figure has been eliminated from the proposal. More appropriate alternatives are discussed.

Page 338 - Technology is not yet completely developed for operations in some of the more hostile environments. This is indicated in the final EIS in the description of natural hazards in Section III and in the formulation of a lease to learn strategy in Section VIII.

Pages 339-340 - These comments have been addressed elsewhere.

Page 341 - The Department has repeatedly made the case that coastal zone plans, if completed and in force by 1977 or 1978, will predate the actual impacts of OCS development in all areas, in some by larger margins than others. The formulation of coastal zone plans must consider the possible impacts of oil and gas operations for completeness, although it is entirely possible that certain sales will not take place, or even be proposed. It is obviously at the Secretary's discretion to follow the schedule and begin the additional analysis in environmental analysis, or he decides to proceed with any given sale once he has weighed all the advantages and disadvantages of such an action.

Pages 341-342 - See response to Alaska comment, Vol. 1, Pages 12-13.

Pages 345-346 - It is important to discuss the environmental impacts that would not occur as a result of a discontinuation of OCS leasing. All concerns about environmental degradation would then be negated. The section on Alternatives deals with the viable energy alternatives to OCS leasing, and their environmental impacts should one elect to discontinue such activity.

Pages 347-409 - The information on PAD V and Alaska energy supply and demand has been abstracted and utilized in the discussion of various energy markets within the U.S. The detailed information has been transmitted to the Alaska Office for its use in a site-specific EIS.

Secondary and tertiary recovery has been included as an alternative energy source.

Pages 410-413 - New regulations concerning geological and geophysical information disclosure have been proposed by USGS (Federal Register, April 18, 1975). These proposed regulations are also the subject of a draft EIS published at the same time. Federal Government sponsored exploratory drilling is discussed as an alternative management tool in Section VIII.

Pages 414-416 - It is within the Secretary's power to conduct lease sales on either a bonus bidding or royalty bidding system. While most sales have been under bonus bidding, OCS Sale #36, Offshore Louisiana included 10 tracts offered on a royalty bidding basis. Analysis of the results of this trial as it relates to efficient recovery and payments to the Government must await discovery of producible quantities.

Page 421 - While lead agencies may have wide latitude in preparing an EIS, the reviewing procedure mitigates gross errors at the very least. Interagency cooperation was sought and obtained on this EIS. Ultimately, all environmental statements are subject to judicial review under NEPA. The State's recommendations regarding preparation and review of OCS oil and gas impact statements have been included.

Regarding the managerial alternatives, 1) and 4) do not seem to have direct environmental consequences. However, they are discussed as possible causative factors in postponing or decelerating the proposed accelerated program (Section VIII on Alternatives) Managerial alternatives 2) and 3) are discounted because the Department feels it has adequate controls on OCS development at the present time. These alternatives both require legislative approval; revision of the OCS Lands Act has been proposed in several bills now being considered in Congress.

Pages 425-426 - The discussion of economics of requiring "best demonstrated environmental control technology" has been removed. The proper place for such analysis, as the State points out, is in the Secretary's background information on all aspects of the program, environmental, economic, and technical. In regard to the new technology that must be developed to operate in some of the more hostile environments of the U.S. OCS, the Secretary must be apprised of the costs of such development. This EIS attempts to portray the environmental costs; other material must be prepared on the economic costs to developers.

Testimony of the Southern California Council of Local Governments

During public hearings held in Beverly Hills, California, a significant amount of the second day's testimony was given by representatives of the Southern California Council of Local Governments (S.C.C.L.G.), an ad hoc group formed out of common concern for the implications of accelerated Federal OCS leasing, especially off Southern California. Members of the Council who sent representatives to testify include the following:

City of Los Angeles
City of San Diego
City of Beverly Hills
City of Santa Monica
City of Santa Barbara
County of Santa Barbara
City of Riverside
City of Newport Beach
City of Torrence
City of Palos Verdes Estates
City of Rancho Palos Verdes
City of Laguna Beach
City of Huntington Beach
County of Orange
City of Claremont
City of Imperial Beach
City of Manhatten Beach
City of Long Beach
City of Hermosa Beach
City of Fullerton
Southern California Association of
  Governments (S.C.A.G.)

Also contributing to the Council testimony were scientists affiliated with various southern California colleges and universities.

Many of the concerns voiced by the SCCLG representatives were detailed in a 363 page analysis of the draft EIS submitted by the Council for inclusion in the hearing record. Attached to the primary report was a series of supplemental papers written by members of the Scientific Advisory Committee to the SCCLG. These reports individually critiqued several specific sections of the EIS.

Many of the criticisms outlined in the supplemental analyses were leveled at the apparent lack of detail and depth of discussion in the draft EIS. The Department feels that the more detailed environmental analysis should more properly be undertaken within the context of the site-specific evaluation rather than in a programmatic-type document. In this respect, many omissions of detail in the program EIS will be rectified in the site-specific analysis that will precede each proposed sale.

The following text, taken from the SCCLG document, summarizes the major concerns put forth by the Council in its analysis. Departmental comments on these issues will follow.

Summary of Analysis of Draft Environmental Statement Regarding "Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf"

The following is a summary of the detailed Analysis of the Draft Programmatic E.I.S. on expanded Outer Continental Shelf (O.C.S.) Drilling prepared by the Bureau of Land Management (B.L.M.). This Analysis has been prepared by and on behalf of the Council of Local Governments Concerned with O.C.S. Development, for presentation to B.L.M. as a portion of the comment and input to be given by the participating jurisdictions during the public hearing and review process.

The Analysis is based upon a comprehensive review of the E.I.S., the Project Independence Blueprint, and over sixty major documents dealing with energy and O.C.S. development. Included in the Analysis is a critique of the E.I.S. prepared by the Scientific Advisory Committee. That Committee was formed, at the request of the Council, to advise the participating jurisdictions as to the accuracy of the data included in the E.I.S., the additional data which should be provided, the additional scientific studies which should be undertaken, and related matters.

I. Requirements for Legally Adequate E.I.S.

The specific requirements regulating the nature and content of the Draft E.I.S. are set forth and established by the National Environmental Policy Act (N.E.P.A.), the Guidelines for Implementation of N.E.P.A. promulgated by the President's Council on Environmental Quality (C.E.Q.), and by the case law interpreting these foregoing provisions. Having carefully reviewed the draft E.I.S. in light of these legal requirements, we have concluded that the draft E.I.S. is seriously inadequate and fails to fulfill the legal mandate that it set forth a "detailed statement of the environmental impact of a project and the project's alternatives."

Specifically, the E.I.S. fails to:

(1) Adequately discuss the relationship between the proposed O.C.S. development and the establishment of a comprehensive national energy policy, with proper reference to the Project Independence Blueprint, as required by law;

(2) Adequately discuss our principal energy alternatives, including most importantly the alternative of energy conservation;

(3) Develop the data on marine resources necessary to an intelligent analysis of the impact of O.C.S. development upon those resources;

(4) Provide a detailed analysis of the primary, secondary, and cumulative effects of O.C.S. development, supported by empirical data or scientific authorities; and

(5) Address the numerous major issues discussed in this Analysis.

II. Inadequacies of the E.I.S.

A. O.C.S. Development as an Integral Part of a National Energy Policy:

Any decision made in regard to O.C.S. development clearly must be made in the context of a comprehensive national energy policy. In that regard, the adequacy of the E.I.S. is severely impaired due to the fact that its completion preceded release of the Project Independence Blueprint. The failure of the E.I.S. to fully consider and weigh the alternatives suggested in the Project Independence Blueprint, and the failure of the E.I.S. to clearly measure the proposed O.C.S. development program in the context of a national energy program, is violative of both the spirit and express requirements of the law.

B. The Need for O.C.S. Development Has Not Been Adequately Demonstrated:

The E.I.S. only refers to the demand projections of the National Petroleum Council, the Ford Foundation Energy Report, and Department of the Interior's own demand projections. There is no reference to the Project Independence Blueprint demand projections. Further, the Department of the Interior's own projections of a 2% to 3% increase in energy growth over the next 25 years is little more than a rough guess of what future energy demands might be. It does not provide a valid basis for a decision regarding greatly expanded O.C.S. development.

We submit that the most useful demand projections are those in the Ford Foundation Energy Report. This Report projects three different scenarios: (1) a historical growth scenario, (2) a technical fix scenario, and (3) a zero energy growth scenario. Even under the historical growth scenario of a 3.4% energy growth rate, the greatly accelerated O.C.S. program now being contemplated by the Interior would not be necessary. Additionally, under either the technical fix scenario or the zero energy growth scenario, O.C.S. development would not be necessary in the time frame now being considered.

The Project Independence Blueprint, which the draft E.I.S. fails to consider, assumes that there will be no significant O.C.S. development in the Pacific, Atlantic or Gulf of Alaska areas. Moreover, a report from the House Committee on

Interior and Insular Affairs, entitled The Trans-Alaska Pipeline and West Coast Petroleum Supply, 1977-1982, indicates that there will be a surplus of petroleum supplies during the period 1977-1982 in the Pacific region. These factors must be considered by the Department of Interior in making any decision to lease in the Pacific, Atlantic, or Gulf of Alaska.

C. The Alternative of Energy Conservation:

A mandatory energy conservation program offers a viable alternative to accelerated O.C.S. development. This alternative was not adequately evaluated by the E.I.S.

Accelerated development of all our energy sources will still not meet unrestrained demand. Economic as well as environmental factors mandate that we adopt a strong energy conservation plan. We suggest that serious consideration must be given in the E.I.S. to the following energy conservation alternatives discussed at much greater length in the Analysis:

1. Transportation:

The Project Independence Blueprint suggests a number of means to greatly increase use of public transit, thereby reducing our national dependence upon the automobile. Additionally, it has been suggested that tax incentives should be developed to encourage automakers to produce more energy efficient cars which are lighter, and have better aerodynamic designs. A tax might be levied on cars not meeting improved fuel economy standards.

2. Building and Urban Design Proposals:

Space conditioning presently accounts for more than 60% of residential energy use. This use can be substantially reduced by requiring better insulation and by modifying building design. The nation's building codes must be updated. The Federal Housing Authority should revise their standards for issuing loans by requiring a life-cycle cost for building designs. Subsidies and guaranteed loans should be provided so that lower income families can increase the energy efficiency of their homes. Over the life-cycle of a house, the cost of improving the energy efficiency of the structure is far outweighed by savings on fuel costs. There are numerous tax incentive programs which can be suggested to improve construction practices.

3. Industry:

Industry consumption accounts for 33% of the total U.S. energy demand. Energy efficiency can be increased in almost all industries by implementing a program designed to promote: (a) better maintenance of existing equipment; (b) recovery of process heat losses; (c) modifying product specifications to minimize consumption patterns; (d) shifting from use of raw materials which require high energy consumption; (e) using natural fertilizers as substitutes for petroleum and natural gas intensive fertilizers; and (f) using recycled materials.

4. Natural Gas:

Continuous use of gas pilot-lights is responsible for consumption of an estimated 223-billion cubic feet of gas annually in the United States. A long-range cost/benefit analysis to the consumer indicates that substituting electric starters for gas pilots is economically justified and would result in substantial energy savings.

5. Lighting:

Lighting accounts for 25% of U.S. electricity consumption. Much of that is used wastefully in decorative or advertising lighting or as a result of over-illumination and should be more stringently regulated.

6. Heating, Cooling and Ventilating Systems:

Approximately 18% of the total national energy consumption is for heating buildings. Much of the energy used in adjusting internal temperatures would not be necessary if buildings were properly insulated and designed. Energy consumption in buildings may be reduced by: (a) use of solar or solar-assisted heating and cooling; (b) heat pumps; (c) rockbed regenerators; and (d) by adopting building codes requiring energy-conserving techniques.

7. Research and Development:

Our nation has failed to make a reasonable allocation of research and development funds between our various energy alternatives, including conservation. Substantial funds should be allotted for development of: (a) heat transfer technology; (b) low temperature heat applications; (c) energy savings in space conditioning; (d) industrial steam production technology; (e) integrated power generation; (f) improvements in efficiency of power generation; and (g) new manufacturing processes.

In summary, the Analysis points out that the E.I.S. completely fails to consider one of the principal alternatives to O.C.S. development -- a mandatory national energy conservation program. The experience of the City of Los Angeles during last Fall's energy crisis proves the value of mandatory energy conservation programs. During the winter of 1973-74, the City of Los Angeles implemented a plan which resulted in a 17% reduction in energy use during the first two months the program was in effect. A study of the results of that plan by Rand Corporation indicates that: (1) lighting changes accounted for most of the reduced use; (2) most business establishments regarded 20% as a reasonable amount to cut without adverse consequences to business; and (3) most businesses are continuing to maintain the reductions they made during that period. The Analysis concludes that with economically and technologically feasible energy conservation practices, our energy growth rate can easily be reduced to 2% annually, and even zero energy growth is possible. Unfortunately, the E.I.S. fails to give this alternative the serious attention it warrants.

D. Other Energy Alternatives:

The E.I.S. discusses several suggested energy alternatives to O.C.S. drilling. However, the treatment of those discussed is clearly inadequate, while other significant alternatives are simply not discussed.

Among the alternatives cursorily examined in the E.I.S. and which are treated at much greater length in this Analysis are solar, geothermal, nuclear, oil shale, hydroelectric and oil importation. The alternatives not discussed in the E.I.S. but considered in this Analysis include bio-energy, wind, and secondary and tertiary recovery from existing wells. Bio-energy we especially feel is advantageous because it supplies energy while solving solid waste management problems. Secondary and tertiary recovery are also sound resource management tools which deserve greater attention. In summary, the treatment of other energy alternatives in the E.I.S. is seriously deficient.

E. Production of Shut-In Wells and Secondary and Tertiary Recovery as Alternatives to Expanded O.C.S. Development:

No mention in the E.I.S. is made of the alternatives to O.C.S. development of production of wells now apparently "shut-in" in the Gulf of Mexico, nor is there an adequate consideration of the alternative of secondary and tertiary recovery from existing wells. The House Sub-Committee on Regulatory Agencies has found that a substantial number of tracts capable of production in the Gulf of Mexico have been classified as shut-ins by the U.S. Geological Survey upon the request of oil and gas companies. The Federal Power Commission has made similar findings regarding the production capacity of oil and gas fields. The question is whether or not classification of a tract as shut-in is appropriate. Substantial evidence seems to indicate that in many cases it is not.

The House Sub-Committee has found that the Department of the Interior has not demonstrated its capacity to efficiently administer the present leasing system. If this is true, what is the justification for greatly accelerated O.C.S. development under the same regulatory system? Whether shut-ins are the result of inadequate manpower and materials, or a desire of the oil companies to develop the areas in the future when prices are higher. the fact remains that the nation appears to have presently leased areas capable of production which are not now producing.

The same concern is applicable to the failure of the E.I.S. adequately to discuss the production capacity which would result in secondary and tertiary recovery. Adequate recovery is not being undertaken at this time because the oil companies apparently do not find it to be economically attractive. Nonetheless, these national resources which have already been tapped should not be left partially developed if they can be fully developed in an environmentally and economically sound manner.

F. The Elk Hills Example of Present Onshore Potential:

The E.I.S. entirely ignores one of the most feasible alternatives to accelerated O.C.S. development, that is the tapping of existing onshore petroleum reserves held by the military. One particular example not even mentioned in the E.I.S. is the Elk Hills Naval Petroleum Reserve. Within 18 months, 230,000 barrels-a-day could be produced from Elk Hills, with maximum production of 350,000 barrels-a-day being reached within 3 years -- well ahead of what can reasonably be anticipated from newly leased O.C.S. areas.

The cost of developing Elk Hills, as opposed to O.C.S. development cost, is dramatic. While offshore wells cost up to $2 million each to drill, with offshore platforms costing as much as $30 million, onshore wells drilled at Elk Hills are normally a fraction of this cost.

Substantial evidence indicates that the Elk Hills Naval Reserve is not necessary for national defense. The President has now indicated that he supports opening this Naval Reserve for domestic consumption. Clearly, it is an example of a meaningful onshore alternative which should have been discussed in the E.I.S.

G. Substantial Evidence Indicates that O.C.S. Development Cannot be Undertaken Within the Time-Frame Proposed

The E.I.S. only superficially discusses the serious problem of the ability of the oil industry to keep production abreast with the proposed increase in leasing due to the major shortages of drilling rigs, equipment and skilled manpower. The findings of two major federal Congressional reports, and the Blueprint for Project Independence, convincingly demonstrates that the leases now proposed for development could not be developed within the proposed time-frame. Further, both the report of the Ad Hoc Committee on the Domestic and International Monetary Effect of Energy and Other National Resources Pricing of the House Banking and Currency Committee, and the report from the National Oceans Policy Study on Outer Continental Shelf Oil and Gas Development in the Coastal Zones, raise serious questions about the viability of accelerated O.C.S. leasing in light of current shortages of equipment, construction materials, and trained personnel. The Project Independence Blueprint indicates that shortages in drilling rigs, tubular goods, and walking draglines cannot be overcome in the short-run period. Even a technical paper released by the Department of the Interior indicates a severe shortage of these necessary materials. In summary, the E.I.S. fails to deal with this significant issue, that is whether accelerated O.C.S. development is in fact a meaningful solution or viable alternative.

H. Mitigation Measures Not Adequately Considered

The E.I.S. fails to consider measures which would mitigate the potential adverse environmental effects of O.C.S. development. The E.I.S. should at the very least consider the following possible mitigation measures:

1. Immediate exploration of the potential lease areas so we would know what is in fact available;

2. Establishing a priority system so that lease sales would first take place in the areas farthest offshore with the least potential environmental impacts;
3. Camouflaging rigs to preserve aesthetic values;
4. Requiring subsea completion of wells to preserve aesthetic values, and reduce navigational obstructions;
5. Establish more stringent drilling and production regulations.

I. Failure to Consider Relative Environmental Impacts

The relative environmental impacts of drilling throughout the O.C.S. must be evaluated prior to any further lease sales. This evaluation was not provided for by the E.I.S.

A report entitled O.C.S. Oil and Gas - An Environmental Assessment, prepared by the President's Council on Environmental Quality, demonstrates that such an analysis is possible. Although limited to the Atlantic coast and the Gulf of Alaska, the C.E.Q. report resulted in a rating of various possible development areas according to environmental sensitivity and resource potential. Southern California has certain unique resources, as do other areas, and efforts must be made to evaluate the impact of O.C.S. development on those resources. In summary, in order for the E.I.S. to be legally adequate, it is submitted that the relative environmental impacts of drilling in various areas throughout the O.C.S. must be developed and discussed.

J. Insufficient Data for Environmental Analysis:

The E.I.S. is replete with admissions that sufficient data is not available regarding marine and coastal resources or the impact of O.C.S. development on those resources. The E.I.S. includes nineteen such major admissions of lack of data. Even though the drafters of this Analysis had extremely limited time and personnel, in all but five of the specific areas involved, we found literature sources providing the necessary analysis. In those areas where data is not now available, the Department of the Interior has an affirmative obligation to develop the necessary data.

One example of the need for additional data is provided by the report of the Southern California Academy of Sciences. This group is presently under contract with the Bureau of Land Management to provide baseline data on the Southern California marine resources. Although the Department of the Interior contends that this baseline data is only needed for monitoring of O.C.S. development, rather than for making the determination as to whether there should be such development in the first instance, it is important to note those specific areas where the scientific community believes additional data is necessary. Thus, the Southern California Academy of Sciences concluded:

1. Geological oceanography, especially in regard to seismic activities off Southern California, is inadequate. Recommendations for numerous studies were made.

2. Additional studies of vertebrate and invertebrate populations, habitats and sevsitivity to oil pollution need to be studied.

3. A better understanding of physical oceanography, including oceanographic and surface meteorology, is needed.

4. A better understanding of chemical oceanography is needed.

K. Degradation of Air Quality:

The E.I.S. only provides a discussion of possible degradation of air quality in terms of the result of evaporation from oil spills. N.E.P.A., however, requires a discussion of both the primary and the secondary impact of a project. Obviously, the onshore activity which is the consequence of O.C.S. development will have a substantial adverse effect on air quality.

Increased refinery capacity and operation will clearly result in substantial increases in sulfur dioxide, particulate matter, nitrogen dioxide, carbon monoxide and hydrocarbons. The air quality in Southern California is far from reaching primary ambient air quality standards set pursuant to the Federal Clean Air Act. Further degradation in air quality will result from increased refinery capacity. This issue should be fully addressed by the E.I.S.

L. The Onshore Land Use Impacts of O.C.S. Development:

The discussion of onshore impacts within the E.I.S. is wholly inadequate. Among the more notable onshore activities having significant primary land-use impacts are the following: (1) harbor and dock facilities; (2) equipment storing areas; (3) pipeline terminals and corridors; (4) tank farms and transportation facilities; and (5) refinery, petrochemical complexes, and supporting construction industries. The potential of these facilities for conflicting with other land-use values, and the resulting environmental impacts, must be fully discussed and considered by the E.I.S.

M. The Santa Barbara Oil Spill -- An Impact Never Discussed:

The E.I.S. never discusses the Santa Barbara oil spill, despite the fact that it is an incident that exemplifies many of the economic and environmental consequences of O.C.S. development. The 1969 blowout from a major channel platform was the result of poor operating procedures and government regulations. Over 3,250,000 gallons of oil spilled into the ocean, resulting in a slick of over a thousand square miles. Over 80 miles of coastline were contaminated. Containment and recovery efforts were woefully inadequate.

Although long-term effects of the Santa Barbara spill on the marine and coastal environment are difficult to estimate, they clearly are substantial. As to short term damages, the cost of replacing dead organisms has been estimated to be over $10 million. Over $10 million was spent by the oil companies for control and cleanup, and approximately $640,000 by governmental agencies' post spill operations. Indirect costs of the spill include diminution of property values and loss of tax revenues. Short term loss to the commercial fishing industry was over $800,000. Loss in recreational value has been estimated to be over $3 million.

The E.I.S. makes no attempt to estimate these very real costs which may result from O.C.S. development, nor is the entire subject of potential impacts from spills or accidents meaningfully developed.

N. Diminution of Property Values:

The E.I.S. fails to discuss the diminution of property values that will result from O.C.S. development. The potential adverse impact upon land values of the aesthetic blight of platforms and potential for oil spills is well demonstrated by the Santa Barbara case. Total diminution of property values resulting from the Santa Barbara oil spill ranged from a total of $6,885,000 to a high of $8,934,000. Potential adverse impacts of these magnitudes must be discussed by the E.I.S.

O. Economic and Resource Losses to State and Local Governments Resulting From O.C.S. Development:

The E.I.S. does not discuss possible adverse economic consequences to local governments resulting from O.C.S. development, nor does the E.I.S. discuss the loss to the public of visual amenities, beach and marine resources and recreational values. Studies from both Louisiana and Texas indicate that local government, in providing services to O.C.S.-related developments, bear substantial economic burdens. The public at the same time suffers a substantial loss of its beach and marine resources.

III. Economic Analysis of the Federal Leasing System

The E.I.S. entirely fails to consider the relative economic merits of alternative leasing systems. This is contrary to the mandate of N.E.P.A. that environmental as well as economic and technical cost benefits analyses must be prepared. With the exception of one trial royalty-fixed cash bonus system, the federal government is now operating under a cash bonus-fixed royalty system which combines an initial substantial cash payment with a fixed royalty established by the Secretary of the Interior based upon the estimated value of leased lands.

The problems resulting from the current system include:

(1) A serious dampening effect on competition; and

(2) Huge vertically-integrated petroleum companies dominate the bidding.

Additionally under the current system, it appears that the Department of the Interior's regulation of leasing schedules is inadequate. As a result, areas may be developed either too quickly or too slowly. Oil drilled in the mid-1980's is now being sold for 1975 prices.

There are at least ten alternative leasing systems (4 royalty systems, 4 rental systems, and 2 profit sharing systems) which deserve serious examination and consideration, including:

1. Fixed royalty/bonus bidding;
2. Fixed bonus/royalty bidding;
3. Royalty schedule decreasing overtime;
4. Two-parameters royalty schedule;
5. Rental payments/bonus bidding;
6. Fixed bonus/rental bidding;
7. Oil pledge/bonus bidding;
8. Fixed bonus/oil pledge bidding;
9. Fixed profit share/bonus bidding;
10. Fixed bonus/profit sharebidding.

In brief, the O.C.S. oil reserves belong to the American people. Before they are leased, it is essential that all principal leasing systems are fully evaluated and considered to ensure that the federal government provides for the most responsible and economically sound protection of our interests.

IV. Procedures for Evaluation

The procedures followed by the Department of the Interior for evaluation of lease sales does not ensure a systematic reasoned decisionmaking process. The procedures for public participation in the hearing process hampers full public participation. The Department of Defense excludes areas from consideration for lease sales, on the basis of national security, in a manner that prevents review of the decisionmaking process. As a result of those exclusions, other areas may be selected for leasing which may be more environmentally sensitive.

V. Substantial Evidence Exists to Indicate That a Determination to Drill Has Already Been Made

Statements from high ranking officials in the Department of the Interior indicate a commitment to O.C.S. development. The refusal of the Department of the Interior to await establishment of a national energy policy, and the refusal to postpone designations until after an adequate final program E.I.S. is considered in the decision making process, indicates that the E.I.S. is only a post hoc rationalization for a decision which has already been made.

VI. The Federal Coastal Zone Management Act

The Department of the Interior's plans to proceed with O.C.S. leasing prior to the completion of coastal zone management plans by impacted states circumvents the purposes of the 1972 Coastal Zone Management Act. O.C.S. leasing should be postponed until such time as the states have had an opportunity to adopt coastal zone management plans and have such plans approved by the U.S. Secretary of Commerce, as provided for in the Coastal Zone Management Act. Once such approval is obtained, any federal agency conducting or supporting an activity directly affecting the coastal zone shall, to the maximum extent practicable, conduct such activities consistent with approved management programs.

The energy element of California's coastal plan adopted by the Coastal Commission on January 23, 1975, proposes for California the policy that new offshore oil and gas development shall be permitted only after: (1) the need for petroleum has been clearly established in light of anticipated flows to California from the Alaska north slope and other production sources, and consideration is given to California's capacity to refine and store anticipated inflows; or (2) development of the O.C.S. off California has been clearly identified as an integral and priority part of a comprehensive balanced national energy conservation and development program. Other policies in the energy element adopted by the Coastal Commission include: (1) allowing offshore drilling only where safe; (2) encouraging consolidation of drilling production and processing sites; (3) requiring the use of submerged completion and production systems where feasible and environmentally safe; (4) minimizing the impact of onshore facilities; (5) establishing an oil spill liability fund; and (6) protecting against any adverse impact of O.C.S. development by seeking an agreement with the Department of the Interior that no federal leases be approved until the Department of the Interior makes a commitment to undertake a comprehensive environmental protection plan in regard to O.C.S. development. The policy recommendations of the California Coastal Zone Conservation Commission have evolved out of a long planning process. The Department of the Interior should not be allowed to circumvent the purposes of the Federal Coastal Zone Management Act by ignoring the position of the California Coastal Zone Conservation Commission in regard to O.C.S. development.

Departmental Responses

I. The major allegations listed under Part I of the Council document are reiterated in more detail in Part II of their discussion.

The following Departmental comments address the specific points raised in Part II, Inadequacies of the EIS.

II. A. The dependence of accelerated OCS development on the formulation of a National Energy Policy may be less than the SCCLG implies. Current leasing policies give the Department flexibility in deciding when, where and to what extent OCS development should occur. These decisions can be made at any stage of the leasing program, as mandated by current national energy needs, environmental and other considerations. The Department feels this approach can be fully as effective as that derived from the synoptic framework of a National Energy Policy, and perhaps more responsive to the Nation's actual OCS energy needs. See Section VIII.A for a more complete discussion of this position.

The final EIS discusses the Project Independence Report in Sections I and VIII.

B. The Department feels that OCS oil and gas resources are substantial. Development of these resources offers a realistic alternative for supplying much of the Nation's projected energy needs and reducing our current dependence on foreign energy imports hence, the accelerated leasing proposal.

Under NEPA, this EIS need not demonstrate the necessity for OCS development i.e. it is not a justification document.

C. Energy conservation appears to offer a viable partial alternative to OCS resource development. The required legislation to make conservation work, however, might well be compromised, as the unanticipated 'costs' of these measures become more apparent. The Nation might then be forced to rely on alternative energy sources having greater potential environmental harm than OCS oil and gas. Section VIII.B discusses the conservation alternative.

D. The EIS section on energy alternatives has been revised and expanded (See Sec. VIII.C.)

E. The USGS through its investigative and regulatory functions, encourages orderly and efficient development of oil and gas leases, and is constantly assessing the effectiveness of its OCS monitoring program.

As noted by the Council, some confusion surrounds the interpretation of the 'shut-in' designation. The Department feels that much of the problem arose from a 1972 change in the USGS shut-in classification along with changes in their method of reporting OCS oil and gas well statistics.

Investigations by the Federal Power Commission and the Department have shown that nearly all operator requests for lease extensions under the shut-in classification are justifiable. Shut-ins may be effected by the operator during the primary lease period without USGS approval.

Secondary and tertiary petroleum recovery could eventually supply significant amounts of petroleum, however current technology and existing economic constraints preclude any sizable near-term contribution from these methods to the Nation's energy needs. Through appropriate production incentives and increased R and D, enhanced recovery could presumably tap this country's extensive secondary petroleum reserves which are now unproducible.

F. Domestic production from the Naval Petroleum Reserves could supplement future OCS production as a viable source of short-term energy Resource. Management of the NPR's now lies within the Department of Defense. Proposals to bring these reserves into production are currently being considered by both the Administration and Congress.

G. As stated in Section I of this final EIS, the Department has taken cognizance of industrial equipment and manpower constraints to rapid OCS development and has consequently reassessed its 10 million acre lease proposal. The June, 1975 proposed 4-year Lease Planning Schedule, outlines the current Departmental proposal to hold six lease sales per year through 1978, to include offerings in all OCS areas. In redefining its leasing proposal, the Department feels that many of the current equipment and manpower constraints to expanded OCS development would be reduced during the several years preceding actual OCS production.

H. 1. Variations of the two-stage vs. one-stage OCS development theme are discussed in Section VIII.E under Alternatives.

2. Section VIII.E discusses several alternative lease scheduling strategies, among them the 'save the worst for last' option. This strategy could be applied to the tract selection phase of leasing, as suggested by SCCLG, thereby postponing development of the environmentally sensitive and aesthetically important nearshore and coastal areas. Balanced against the environmental benefits of this approach is the increased spill risk associated with operations in deeper offshore waters. It should be mentioned that present tract selection procedures take cognizance of known environmental hazards in the proposed lease area.

3. Aesthetic aspects and related alternative mitigating proposals are discussed in Section III.B on Impacts.

4. Section I.C contains an updated discussion of subsea completion technology. Potential mitigated impacts from the use of these systems are addressed in Section III.B.

5. The Department has initiated efforts in several areas to improve the environmental safety of OCS development. These efforts include (a) supporting legislation that would broaden oil spill liability, (b) developing new OCS operating orders for frontier leasing areas to reflect unique operating conditions in these regions, (c) initiating both inhouse and external safety management evaluations of USGS regulatory functions on the OCS, and (d) raising USGS personnel levels in order to more closely monitor offshore oil and gas operations.

I. Data on relative environmental impacts for the various OCS areas are discussed in Section III. Relative assessments of several impact parameters - estimated throughput spill rates, natural hazards, unique biota, proximity to coastal resources - are individually discussed and then combined into a summary matrix table (Table 123). Summary matrix assessments are finally combined to produce an overall categorization of environmental risk for each OCS area.

J. As stated previously, Section III on Impacts has been revised. In addition to presenting the analysis of relative impacts outlined above, Section III properly emphasizes the generic aspects of OCS development. Admittedly, specific data gaps exist for the various OCS regions, however this fact does not obviate the ability of a programmatic impact statement to adequately assess generic environmental impacts of offshore oil and gas development. Ongoing literature surveys, BLM-funded environmental studies and other research will generate much of the data needed to assess impacts unique to a specific OCS area. These non-generic impacts are more properly evaluated within the context of the site-specific EIS.

K. A general discussion of possible air quality problems associated with OCS oil and gas development can be found in Section III.J, "Impacts Not Unique to Region." Potential impacts on air quality from OCS development in specific geographic regions will be addressed in the site-specific EIS for that area.

L. Again, from a programmatic viewpoint, generic onshore land use impacts resulting from OCS development are discussed in Section III.J, which incorporates significant additions to the precursory draft EIS discussion.

M. Following the 1969 Santa Barbara Channel oil spill, the USGS revised its OCS Operating Orders. The current Pacific OCS Orders date from a further revision effective June 1971. OCS Operating Orders are periodically reviewed and, if necessary, revised as new technological and environmental information becomes available. These changes serve to enhance the environmental safety of OCS operations through stricter regulations and more effective compliance criteria.

The 1969 spill also highlighted the need for more intense monitoring of offshore oil and gas activities. The USGS has responded to this need by increasing its inspection staffing and conducting more frequent inspections of offshore facilities.

The Santa Barbara spill and its related impacts are discussed in Section III.B and III.D. of this EIS.

N-O. Although difficult to quantify, some diminution in land values will probably occur along highly valued recreational and scenic coastal areas, as a result of OCS development. Alternately, local appreciation in land values will undoubtedly occur through development of other, currently low-premium coastal areas.

Legislation is now being considered which emphasizes greater liability compensation from oil spillage and other negative impacts of OCS development. Many of the proposed measures contain Federal-State revenue-sharing provisions for OCS production revenues. Section discusses the revenue-sharing alternative.

III. Under the provisions of the OCS Lands Act of 1953, the Secretary of the Interior is authorized to hold competative oil and gas lease sales on the outer continental shelf under either a cash bonus-fixed royalty or royalty-fixed cash bonus system. Although some of the alternative leasing systems outlined by the Council may have merit, existing legislation precludes their use.

In their expanded discussion concerning economic aspects of the leasing system, the Council recommended Federal participation in pre-lease OCS oil and gas exploration. Under this arrangement, the Government would benefit from having access to the same resource data as industry so as to help insure receipt of fair market value in leasing resource areas. Many of these benefits will be similarly realized when proposed regulations governing the permitting and disclosure of geological and geophysical OCS exploration data are adopted by the USGS. The submission of G + G exploratory data to USGS is now required under preliminary regulations outlined by the Department in a Federal Register notice effective December 11, 1974 (FR 39 (242), Dec. 16, 1974). Section VIII discusses possible Federal involvement in OCS exploration.

IV. In alluding to limitations on public participation in the hearing process, the Council outlined four criticisms. These included: (a) the short time frame for public review and comments, (b) hearing topics, as suggested by the Department, were balanced in favor of the proposal, (c) public was unable to question hearing panelists, and (d) restrictions on who and how long one may testify at the hearings.

Problems related to item (a) were primarily caused by the unanticipated large demand for the draft EIS, which required ultimately several reprintings. In light of the delays associated with distribution of the EIS, the Department twice postponed the hearing dates in order to allow sufficient time for public review of the document.

Concerning, item (b), while the Department does suggest broad topic areas for hearing discussion, this practice does not bias actual testimony either for or against the proposal. The diverse mix of opinions expressed during all three public hearings highlights the open nature of these proceedings.

As acknowledged by the Council, the Department views the public hearing as a means of gauging public sentiment and acquiring useful information and suggestions concerning environmental aspects of the proposal. This opinion parallels that taken by CEQ in its August, 1973 Guidelines for EIS Preparation. Expanding this role to include policy debate would lead to procedural chaos.

Concerning public participation at the hearings (item d), anyone who wishes to testify may register with the Department, specifying a particular date and time if desired. Reasonable requests for additional presentation time are routinely honored, as are those for multiple-member group testimony. Beyond established proto for testimony by government officials, these requests are honored on a first come-first served basis.

V. Statements made by Department officials concerning the 10 million acre lease proposal served only to outline program parameters related to that proposal. Both the Department's redefinition of the initial accelerated leasing proposal and the June 1975 revision of the November 1974 planning schedule serve to illustrate the tentative nature of these program proposals and underscores their role as planning measures rather than irreversible commitments to lease.

VI. The argument that OCS leasing in frontier areas must be postponed until coastal States finalize their CZM plans carries the implication that no effective coastal planning can occur before that time. This is not the case. Intelligent planning decisions can be made within the framework of existing State CZM policies for many aspects of coastal development. States which have not yet finalized their CZM plans estimate these policies can be implemented by 1977, well in advance of the onset of production from accelerated OCS leasing.

Recognizing the importance of coastal State involvement in the planning phase of OCS development, the Department recently proposed the creation of an OCS policy advisory board similar to its OCS Research Management Advisory Board established in 1974. The policy board would be similarly comprised of various Federal agency representatives as well as representatives from each coastal State, and would provide a forum for keeping the states abreast of Federal OCS program activities while encouraging them to offer comments and recommendations on OCS policy decisions.

CLAIRE T. DEDRICK
SECRETARY

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Department of Fish and Game
Department of Navigation and
Ocean Development
Department of Parks and Recreation
Department of Water Resources

Air Resources Board
Colorado River Board
San Francisco Bay Conservation and
Development Commission
Solid Waste Management Board
State Lands Commission
State Reclamation Board
State Water Resources Control Board
Regional Water Quality Control Boards

THE RESOURCES AGENCY OF CALIFORNIA
SACRAMENTO, CALIFORNIA
FEB 2 1 1975

Bureau of Land Management
U. S. Department of the Interior
Washington, D.C. 20240

Gentlemen:

The State of California has reviewed the "Draft Environmental Statement, Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf (DES 74-90)", undated, which was submitted to the Office of Planning and Research (State Clearinghouse) within the Governor's Office. The review was coordinated with the Departments of Conservation, Commerce, Fish and Game, Food and Agriculture, Health, Navigation and Ocean Development, Parks and Recreation, Transportation, and Water Resources; the Public Utilities Commission; the State Water Resources Control Board; the Air Resources Board; the San Francisco Bay Conservation and Development Commission; the Solid Waste Management Board; the State Lands Division; and the California Coastal Zone Conservation Commission. Our comments on the draft statement are set forth below.

Water Quality

1. Environmental Impact of Proceeding With Proposed Program From the Point of View of an Agency Authorized to Develop and Enforce Environmental Standards

The Environmental Impact Statement (EIS) should provide a full assessment of the impacts of the program that result from the increased risk of significant oil spills from platforms, pipelines, loading facilities, barges, and ships. We are concerned because initial leases in the increased program will probably be in Southern California. Northern California and Oregon lands are not estimated to be as productive or desirable by oil companies (page 329, Vol. II). The risk of adverse impacts to the coastal areas is enhanced by the tendency of winds and ocean currents to bring petroleum materials toward shore in Southern California, and the importance of resources directly dependent on water quality. Such resources include the kelp beds which provide a habitat for numerous marine species of importance to sport and commercial interests. The State Water Resources Control Board has recently designated specific coastal areas as "Areas of Special Biological

Significance" (Attachment 1). The Board intends to prohibit discharges to these areas to prevent adverse effects on natural water quality. Twenty of these areas are between San Francisco and the border of Mexico where we would expect additional lands to be offered for lease under the intensified program. The EIS should discuss the possible and probable impacts of development and operation of wells, transport, and refining on identified areas of high environmental value and sensitivity.

Is not a risk of adverse impacts along the cost of Southern California increased because the resources of the area are considered to be under stress (page 317, Vol. II)? The draft EIS endorses the quotation on page 169, Vol. II that "...a single catastrophic spill could well create effects that are far beyond the natural recuperative powers of the ecosystem". The EIS should describe in greater detail the vulnerability of mainland and island coasts to major spills, the increase in probability of such spills generated by the proposed action, and the actual probability of successful mitigation actions.

The risk of chronic impacts on aquatic life is increased because of the increased number of minor spills, waste discharges, and new effluent constituents from refineries and ancillary facilities which will accompany the increased production of petroleum products. The Board has assisted in funding a study by the California Department of Fish and Game which covers the frequency, quantity, and causes of oil spills in major harbor areas during recent years. The report shows that most of the more than 500 spills per year result from human error during fuel transfer operations. The increased activity will likely increase the number of spills substantially. The report also shows that the tainting of fish flesh by petroleum products and oil spill cleanup agents could be correlated directly with the time of exposure and more frequent spills will increase the time of exposure. The EIS should include a more detailed discussion of cumulative impacts, decay times for impacts of individual events, and residual impacts after known mitigation procedures have been applied.

If there is a significant increase in the number of leases in Southern California and a resulting increase in oil production, the EIS should consider a significant local increase in production and handling facilities that is out of proportion to existing national import tonnage and domestic production. This facilities increase will, in turn, result in increased waste quantities, waste effluent, and need for waste treatment facilities, all of which should be considered by the EIS.

The priority given to this program by federal agencies should not lead to relaxation of water quality standards. The EIS should discuss the interaction of such an accelerated program with existing efforts to maintain and improve water quality.

The EIS should clearly appraise whether the aggregate effect of the accelerated leasing program is increased degradation of water quality in areas of high production. Even though each individual development may result in impacts which are not great and from which the ecosystem could recuperate theoretically, will the rate of continual assaults result in a cumulative adverse impact? The EIS should discuss the cumulative effect of oil spill incidents and indicate the range of increase to be expected under different degrees of development for each proposed area.

2. Comments on the Proposal to Increase Leasing to 10 Million Acres by 1975

The EIS does not establish that it would be feasible to lease 10 million acres per year or that major oil companies could undertake exploration at the rate required to lease lands for production within the time allowed. The draft states (page 325, Vol. II) that an offer of 14 to 19 million acres would have to be prepared to obtain leases on 10 million acres. We understand that an offer requires a site-specific EIS for each tract of land in the offer. If the Bureau of Land Management (BLM) attempts to prepare that many EIS's as using existing data and staff capabilities, will it be possible to comply with the intention to determine adverse impacts prior to lease? We are aware that Congress may appropriate additional funds for BLM and the Geological Survey to increase their programs in order to comply with the objectives of this program. However, it seems apparent that no new data of significance will be available from these programs for at least one year, and such expansion could not help in the selection of lands to be included in the offers for 1975.

We are also concerned that the attempt to achieve a goal of leasing 10 million acres per year might stifle or reduce in priority the planning for development of other energy resources. Will allotment of funds and agency resources to this program reduce the nation's ability to consider the relative merits of developing alternative energy sources? This possibility is noted on page 321 of Vol. II, but it should be amplified.

The proposed program will also have secondary impacts on coastal planning in the affected states without providing a definite program for giving the states a voice in the decisions regarding offerings or assistance in coastal planning programs. In this regard, we note that new legislation (S3221), cosponsored by Senator Alan Cranston of California, would give coastal states an opportunity to provide input on the timing of federal oil leases and would provide grants for planning and the amelioration of adverse environmental impacts associated with the development of federal energy resources. We support these concepts.

The attempts to achieve a goal of leasing 10 million acres in 1975 can be expected to lead to poor quality assessments and inadequate disclosure of impacts. As an example, the description of water quality in California (pages 92-101, Vol. II) was taken from the Water Resources Council Comprehensive Framework Study, California Region, of 1971. The material selected for the draft EIS is out of date, out of context, and extremely misleading. Such information is not an adequate basis for estimating impacts.

As examples of the misinformation contained in the EIS, the water quality conditions described in San Diego and Monterey Bays and in Los Angeles Harbor no longer exist and will not occur during the lease period. San Diego Bay does not receive large quantities of raw wastewater, garbage, trash, and oil as stated in the EIS and the Bay is not considered polluted. Bacterial contamination of beach areas in Monterey and Carmel Bays existed in the past but upgraded sewage treatment plants have improved conditions and a new regional wastewater system has been initiated in southern Monterey Bay which will prevent future problems. Discharges from coastal cities have been reduced in number and treatment has been upgraded to the extent that they are not a source of coliform bacteria problems on recreational beaches as stated in the EIS.

The description of conditions in Los Angeles Harbor is particularly inadequate. The last refinery discharges to Dominguez Channel and the inner harbor were removed in 1969. Only cooling water discharges remain. All brine discharges to the harbor have been removed and dissolved oxygen is not being depressed in the inner or outer harbor.

3. Compliance of EIS with the National Environmental Protection Act

A. Description of Project

The EIS present a series of scenarios (page 326, Vol. II) for locations of areas to be leased to make up the total 10 million acres. The importance of environmental effects will be dependent on the selection of areas to be leased. The EIS should provide some estimate of the maximum development which could be experienced in each area if it were to be selected and concurrent estimates of maximum environmental impacts to be expected from such development. Environmental impacts will be related to the number of platforms constructed, the amount of oil handled, and the proportion of platforms constructed in areas of high vulnerability or high environmental risk. The expected number of platforms is cited as "upwards of 500" (page 305, Vol. II); approximately 1,000 (page 312, Vol. II); "as many as 1,600" (page 319, Vol. II), and "from 500-1,000" (page 311, Vol. II). Each citation is used to predict the magnitude of some particular effect of construction. These inconsistent estimates should be replaced by tables indicating probable levels of effect for a range of values extending from the minimum expected construction to the maximum for each potential lease area. In no case should a single minimum figure be quoted as though it represents the entire range of possible impact magnitudes. (e.g., page 307, Vol. II, where a range of from 170,000 to 245,000 bbl is quoted as 170,000 bbl.) Similarly, estimates of volumes of oil handled and occurrence of construction in high risk areas should be treated by first indicating the form of action conducive to a maximum effect and then supplying qualifications indicating the probability of occurrence of such a maximum.

B. Environmental Impact

Environmental impacts of the proposed project only can be assessed from a background presentation of impacts arising from current practices. The EIS does not supply a complete and succinct account of environmental impacts arising from existing practices and does not indicate, except in the most general terms, how future impacts might be predicted from present observations.

Single events are cited in some detail, but should be supplemented by quantitative estimates of the probability of recurrence of similar events. Volume II, page 323, suggests that future impacts on fish and wildlife should be of about the size of already accrued impacts in the Gulf of Mexico since the new leasing area is roughly equivalent to the area already under lease in the Gulf. No estimate of the already accrued impact due to oil drilling development is presented in the description of the Gulf environment in Volume I. A detailed description of the size and nature of these impacts should be supplied.

Adequate predictions of environmental impacts requires adequate prior description of the proposed action. The EIS should present the best available estimate of maximum impact associated with each potential maximum development state, and then supply discussion of expected mean and minimum impacts and their probabilities. The comment (page 172, Vol. II) which suggests that oil spill effects on marine mammals will be negligible as long as they are able to escape the area of the spill should be replaced with a description of known vulnerabilities of marine mammals to oil spills.

C. Adverse Impacts Which Cannot be Avoided and Mitigation Measures

Where adverse impacts are identified as possible, but are not susceptible to quantitative measurement, the EIS should describe the necessary data acquisition and analysis as part of the mitigation measures necessary to reduce adverse impacts. Assertions of certainty of occurrence of oil spills (page 169, Vol. II) are of little value without predictions of frequency and magnitude of possible events. The EIS refers to frequency of collisions between vessels and platforms (Vol. II, page 279-280) and to frequency of spills and gas leaks in existing fields (Vol. II, page 309), but makes no attempt to predict their recurrence rate under development. The discussion should formulate the best available estimates of future adverse events consonant with each degree of proposed development. Particular attention should be given to the maximum individual occurrences and the magnitude of associated environmental consequences.

D. Alternatives

The section on alternatives is cursory and omits the major requirement of the Council on Environmental Quality guidelines for this section, the comparative evaluation of the environmental benefits, costs, and risks between the proposed action and each alternative. Pages 331 and 332 of Vol. II acknowledge that the environmental impacts of alternative leasing schemes are dependent upon the degree of development experienced. A range of impact intensities should be presented for each leasing alternative covering an established reasonable range of development levels.

E. Relationship Between Local Short-Term Uses and Long-Term Productivity, Irreversible, and Irretrievable Commitment of Resources

The discussion of "Mineral Resources" (page 321, Vol. II) questions the worth of the proposed action by indicating that such rapid development may create an intensified future crisis of energy supply. This consideration should be discussed in some detail in the "Alternatives" section, under the headings of "No Increase" or "Postponement," and in Section VI (page 317, Vol. II).

Historical Preservation

The Draft Environmental Impact Statement failed to adequately consider the Bureau of Land Management's responsibilities in compliance with the National Historic Preservation Act of 1966 and Executive Order 11593, "Protection and Enhancement of the Cultural Environment."

Section 800.4(a) of the Procedures for the Protection of Historic and Cultural Properties requires "as early as possible and in all cases prior to agency decision concerning an undertaking, the Agency Official shall identify properties located within the area of the undertaking's potential environmental impact that are included in or eligible for inclusion in the National Register." Section 800.4(a)(2) further specifies that "to identify properties eligible for inclusion in the national register, the Agency Official shall, in consultation with the State Historic Preservation Officer, apply the National Register Criteria, set forth in 36 CFR 800.10, to all properties possessing historical, architectural, archeological, or cultural value located within the area of the undertaking's potential environmental impact."

Fish and Wildlife Concerns

The Department of Fish and Game has expressed concern about (1) oil spill liability, (2) basic data collection, and (3) oceanic bird loss. Attachment No. 2 expresses in more detail those concerns and are to be considered as an integral part of these comments.

Coastal Zone Conservation Commission Concerns

The Commission has several general comments which are discussed below. Attachment No. 3 includes detail comments on Volume II. The attached pages of detailed comments of the Commission are an integral part of this letter.

1. The goal of leasing 10 million acres in 1975 is too arbitrarily and hastily conceived to be acceptable as a sound basis for energy development, for land use and environmental planning, or for good business practice in management of the nation's natural resources. Without documentation the goal sets in motion the maximization of resources recovery and the minimization of environmental impacts. It is not specifically designed to meet identified, or identifiable, geographic energy needs. It does not appear to be related to the realities of available investment capital, drilling and production equipment, or trained manpower, either within government or private industry. It threatens to make meaningless the land use planning and coastal management efforts of the past several years.

2. The portions of the draft statement pertaining to California are too sketchy to be of value in judging the potential impact of the program on this State or its coastline. The descriptions of existing California coastal land uses are too general to be useful. The descriptions of the oil and gas resources are altogether too inadequate--especially for Central and Northern California, for which descriptions or data are nearly nonexistent. There is no significant effort to translate development of the Central and Northern California resources into possible onshore consequences.

3. If indeed the onshore impacts of OCS development are the most visible and longest lasting, then the materials (studies by the Council on Environmental Quality and Resource Planning

Associates, Inc.) describing in detail the land use and socio-economic effects of onshore development, and presenting analyses of hypothetical development areas, ought not to be dismissed by only scanty reference. From the material in the EIS, for example, it is simply not possible to understand what assumptions were made and what conclusions were drawn in those referenced reports with regard to San Francisco as an onshore development area. Furthermore, the EIS does not give any justification for San Francisco having been the hypothetical area studied, when all else in the statement points to OCS development in Southern California.

4. To the extent that the draft EIS does attempt to identify the kinds of onshore impacts of OCS development, the primary focus appears to be on new refinery capacity that may result. It seems reasonably clear that OCS development in either California or Alaska will not itself result in additional refinery capacity in California, unless it leads directly to higher consumption levels in California than are presently forecast. The focus, rather, should be on treatment and storage facilities, intrastate and interstate pipelines, the need for tanker facilities, and the need for refinery desulfurization capability, among other things.

5. Despite its many shortcomings as a statement of any real use for evaluating the specific impacts of the proposed program on the California coast, the draft EIS does state that "California's coast is its single most valuable natural resource" (Vol. II, page 27); that 10 million people, or one-half of the State's population, live in the coastal counties from Santa Barbara to San Diego--Precisely those areas most affected by the Southern California leasing program--and they do use the coastal resource intensively; and that oil spills, both major and chronic, will inevitably result from OCS development. The Coastal Commission staff hopes these observations and conclusions will be kept in clear focus as decision-making on the proposed program proceeds.

6. On January 21, 1975, the Coastal Commission adopted as part of the Energy element of the Coastal Plan a series of findings and policies pertaining to petroleum exploration and production. Those findings and policies will be forwarded as soon as staff has completed compiling final amendments made by the Commission during the adoption proceedings.

State Lands Division Concerns

The State Lands Division felt that the draft is quite comprehensive and reasonably complete. However, the agency did wish to comment on several items. Attachment No. 4 contains those comments which are to be considered as an integral part of the State's comments.

Public Utilities Commission

The statement presented by the California Public Utilities Commission at the Bureau of Land Management hearings in Southern California on February 7, 1975, is a matter of record.

Recommendation

It is recommended that the final statement respond to the concerns and include the views set forth in these comments.

Thank you for the opportunity to review and comment on the draft statement.

Sincerely,

Larry E. Moss

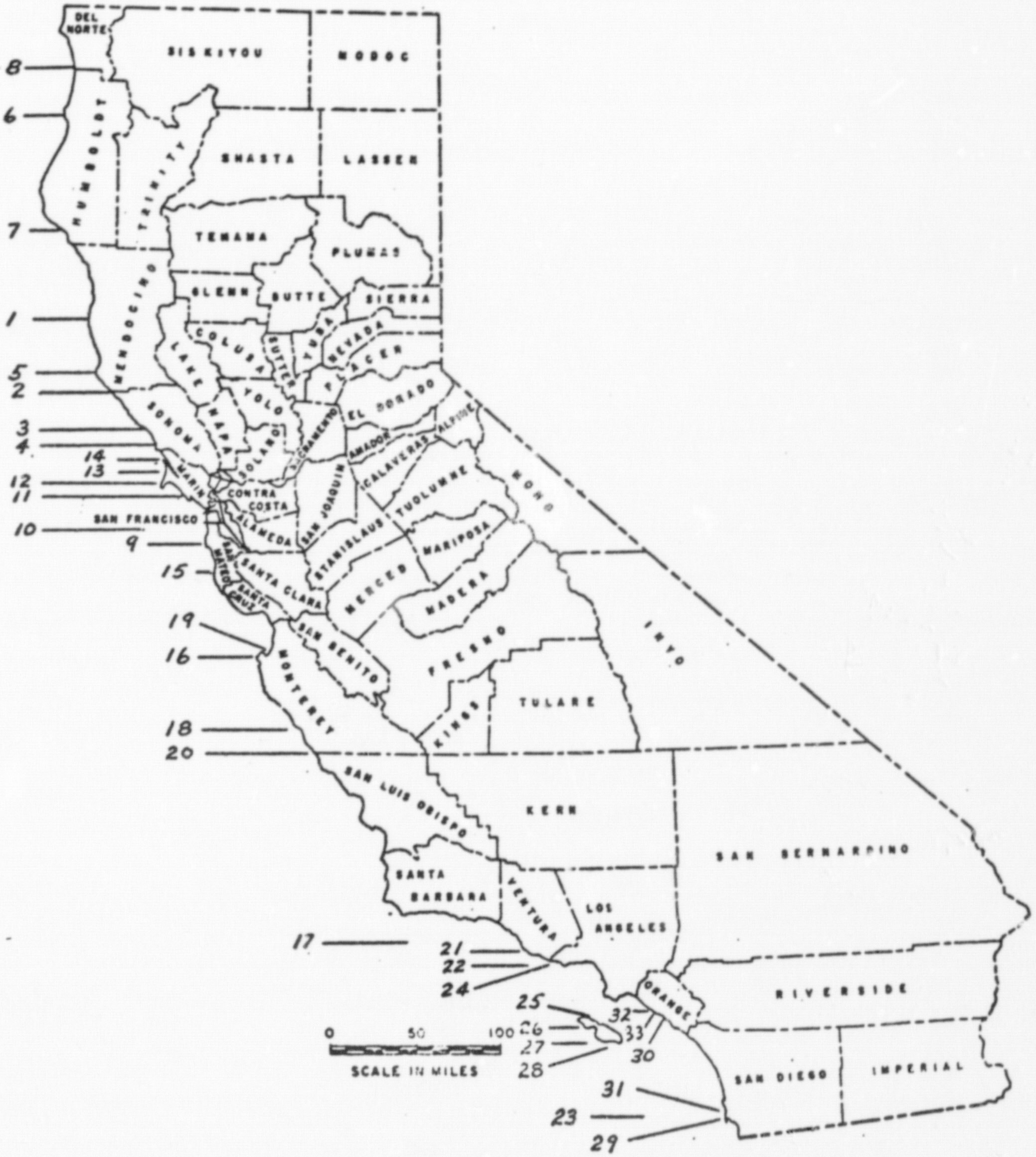
for CLAIRE T. DEDRICK
Secretary for Resources

Attachments

cc: Director of Management Systems
State Clearinghouse
Office of Planning and Research
1400 Tenth Street
Sacramento, California 95814
(SCH No. 74112556)

Attachment No. 1

STATE WATER RESOURCES CONTROL BOARD
AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE
DESIGNED MARCH 21, 1974, AND APRIL 18, 1974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CALAVERAS
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CONTRA COSTA
SAN JOAQUIN
TUOLUMNE
MONO
SAN FRANCISCO
ALAMEDA
STANISLAUS
MARIPOSA
SAN MATEO
SANTA CLARA
MERCED
MADERA
SANTA CRUZ
SAN BENITO
FRESNO
INYO
MONTEREY
KINGS
TULARE
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KERN
SAN BERNARDINO
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VENTURA
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STATE WATER RESOURCES CONTROL BOARD
AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE
DESIGNED MARCH 21, 1974, AND APRIL 18, 1974

1. Pygmy Forest Ecological Staircase
2. Del Mar Landing Ecological Reserve
3. Gerstle Cove
4. Bodega Marine Life Refuge
5. Kelp Beds at Saunders Reef
6. Kelp Beds at Trinidad Head
7. Kings Range National Conservation
8. Redwoods National Park
9. James V. Fitzgerald Marine Reserve
10. Farallon Island
11. Duxbury Reef Reserve and Extension
12. Point Reyes Headland Reserve and Extension
13. Double Point
14. Bird Rock
15. Ano Nuevo Point and Island
16. Point Lobos Ecological Reserve
17. San Miguel, Santa Rosa, and Santa Cruz Islands
18. Julia Pfeiffer Burns Underwater Park
19. Pacific Grove Marine Gardens Fish Refuge and Hopkins Marine Life Refuge
20. Ocean Area Surrounding the Mouth of Salmon Creek
21. San Nicolas Island and Begg Rock
22. Santa Barbara Island, Santa Barbara County and Anacapa Island
23. San Clemente Island
24. Mugu Lagoon to Latigo Point
25. Santa Catalina Island - Subarea One, Isthmus Cove to Catalina Head
26. Santa Catalina Island - Subarea Two, North End of Little Harbor to Ben Weston Point
27. Santa Catalina Island - Subarea Three, Farnsworth Bank Ecological Reserve
28. Santa Catalina Island - Subarea Four, Binnacle Rock to Jewfish Point
29. San Diego-LaJolla Ecological Reserve
30. Heisler Park Ecological Reserve
31. San Diego Marine Life Refuge
32. Newport Beach Marine Life Refuge
33. Irvine Coast Marine Life Refuge

Attachment No. 2
Specific Comments on the Draft Environmental Statement Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf(DES 74-90)
By Department of Fish and Game, State of California

The following comments refer to specific items of the draft environmental statement.

1. Page 114, Vol. 1 of 2 - Liability for oil spills. OCS Order No. 7. This order spells out the pollution damage the lessee is responsible for, but does not incorporate the costs of monitoring oil spills. The lessee should be responsible and liable for all costs associated with an oil spill. This responsibility should be incorporated in each lease.

2. Page 140, Vol. 1 of 2 - Other Potential Data Gathering Programs. The inference here and elsewhere is that future baseline resource studies will be undertaken through universities and consulting agencies. The U. S. Fish and Wildlife Service views action through a Research Management Advisory Board as a threat to Federal and State agencies' responsibility for fish and wildlife basic data collecting. We believe that such funds should be provided to either State or Federal wildlife agencies.

3. Page 446, Vol. 1 of 2 - Second and third paragraphs. This alludes to a small avian population. It should be qualified to clearly state that it does not reflect the seasonal intercontinental movement of pelagic birds offshore or shorebird migration along the coastline.

4. Page 180, Vol. 2 of 2 - Oceanic birds. Evidence is cited of enormous loss of seabirds in the North Atlantic and other oceanic areas due to oil pollution. Such disaster could occur in California when oil spill occurs near and at the time of year when seabirds are nesting in great numbers on offshore rocks and islands or when pelagic birds are migrating. Baseline data are urgently needed to pinpoint when and where such bird migrations and concentrations occur and how the potential threat can be eliminated. We cannot accept that all that can be done to protect this resource is to control and remove oil from spills after they result.

Attachment No. 3
Specific Comments on Volume II of the Draft Environmental Statement Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf (DES 74-90)
By California Coastal Zone Conservation Commission, State of California

1. Page 10. We concur in the description of the particularly extensive loss of natural estuarine areas in Southern California, and in the statement (p. 11) as to the importance of such areas to various life cycles. It is important that this state of decline should not become the baseline for judging the environmental impact of OCS programs. A principal goal of the Coastal Plan is to promote restoration of such resources where possible; and OCS planning should take into account the possibility that drilling and production will preclude or inhibit attainment of this goal.

2. Pages 18-23. Paragraph 2, p. 18, accurately presents the reasons for identifying existing land uses for use in OCS-related planning, except that it does not present the possibility that protection of existing land uses may require that OCS-related development be precluded.

   The land use descriptions presented for Southern California and Central California are so sketchy as to be practically useless, even for the limited purposes of a programmatic statement.

   The land use "breakdowns" presented on pages 20 and 22 understate the reational value of the coast. Much of the "recreation" along the coast occurs in the "undeveloped" stretches, along which people drive, bicycle, or hike and enjoy the scenery. The figures given suggest that coastal recreation occurs only at designated beaches and parks, or at private recreational facilities. The same point is true for the figures given in paragraph 3 of page 27.

3. Page 27. We wish to underscore the importance of the statement "California's coast is its single most valuable natural resource," and the significance of the findings that follow that statement on page 27.

4. Page 28. Paragraph 3 on this page points out that urban recreation demand is "the most prominent feature of California's recreation problems." It is precisely for these reasons that the Coastal Commission is so concerned with OCS development immediately off Southern California, where one-half the State's population resides in coastal counties from Santa Barbara to San Diego, and is heavily dependent on the coast for recreation opportunity.

5. Page 31. The Coastal Commission wishes to underscore the significance of the Channel Islands as an ecologic and recreation resource. The Marine element adopted policies recognize the Channel Islands as an "area of special biological significance," and the Recreation element adopted policies propose maintaining the Islands as open space for low density recreational use.

6. Page 48. The first paragraph notes the absence of designated ship traffic lanes along the West Coast. Major OCS development should be accompanied by increased vessel traffic planning and control along the West Coast, and should be consonant with increasing vessel traffic (oil tankers, LNG carriers, and general cargo vessels).

7. Pages 60-61. The entire description of the Northern California oil and gas resource in this document consists of a single line in each of Tables A through E stating that there is no present production, that there are no measured or inferred reserves on either State or Federal lands, and giving very rough estimates as to the undiscovered recoverable resource, ranging from "zero" upward. There are no maps, no descriptions of the areas of particular interest, and no history of previous interest in the resource that would justify the area's inclusion in the accelerated leasing program. The document would be greatly strengthened by inclusion of such information obtainable from the California Division of Oil and Gas and the State Lands Division.

8. Page 81. Again, we underscore the significance of population distribution in California.

9. Pages 107-108. The draft report points out in the last paragraph, page 108, that "in terms of air quality, problems along the Pacific Coast areas of Southern California are most affected," and goes on to suggest that elsewhere in California the chances of problems "resulting from offshore oil and gas operations remain small." It is precisely in Southern California, however, and directly offshore of the badly polluted South Coast Air Basin, wherein 49 percent of the population resides, that OCS development seems to be moving ahead most rapidly. Adequate planning for OCS development should include a direct focus on restoration of air quality in the South Coast Air Basin.

10. Pages 157-158. We concur particularly in lines 1-5, p. 157, and lines 4-12, p. 158.

11. Page 160. There should be mention of oil being washed into the sea by rain runoff.

12. Pages 160-161. In describing these discharges, the text seems to accept various practices as "givens" of platform operation.

There is no absolute need to discharge drill cuttings, drilling fluids, or formation waters overboard. If such practices do have, or may have, an adverse environmental impact, alternative disposal should be found. The text should read, "The industry practice has been to discharge...." California, for example, has tough regulations governing disposition of formation waters.

13. Page 169. It is important that the conclusions that "sooner or later a major spill will occur wherever there is significant development of offshore exploration and production..." and that "thousands of minor spills will occur" will be kept in very clear view as planning for OCS development proceeds.

14. Page 170. The draft statement says, "Our greatest concern is for coastal areas and estuaries," but proceeds to say that it is not likely that significant amounts of oil spilled from platforms would reach most coastal areas, because of the distance from shore,...." We share the concern for coastal areas and estuaries, and suggest that the ensuing conclusion does not apply to some areas off California that are proposed for inclusion in the offer of leasing.

    The conclusions as to the impact of formation waters on plankton and red tide justify the strict requirements of California agencies on formation water disposal.

15. Page 186. We concur that there is adequate justification for requiring utilization of best available technology to prevent low-level (or higher-level) pollution. A recently adopted policy of the Coastal Commission would so require.

16. Pages 212-213. The findings that pipeline terminal or transfer facilities located in or near the beach or other area used for recreation will be long-term and "will diminish the quality of the area for recreational enjoyment" are particularly significant, as is the conclusion that the impact of such facilities can be "mitigated by locating these facilities at some distance inland where recreational use is not intense."

17. Page 214. At line 2, "tourists" is insufficient; these businesses may depend most heavily on local residents.

18. Page 226. In paragraph 2, it is stated that "This study assumes that all Gulf of Alaska crude oil going to the Puget Sound and San Francisco areas will require additional refining capacity beyond that constructed for North Slope or imported crude." Refinery capacity on the West Coast is almost certainly related to State--and perhaps regional--market requirements rather than to crude supply. Surplus amounts of crude oil on the West Coast are likely to be transported as crude to other markets. The sentence at the end of paragraph 1 on this page

more accurately presents the proper approach: "In each PAD V demand area, added refinery capacity was estimated only to the point of self-sufficiency for the area."

19. Page 227. The Resource Planning Associates' (RPA) summary impact conclusions presented on this page are probably more relevant to planning on the Atlantic and Gulf Coasts than on the California coast. California is not expecting significant new refinery and petrochemical industry development caused by deepwater port development; furthermore, it is not clear that in California the parallels between deepwater terminal planning and OCS planning are close. Along a coast as long as California's, there is great flexibility in terminal siting; the location of the offshore oil resource, on the other hand, dictates to a considerable extent where onshore facilities must be placed, and thus greatly limits the options.

    With regard to the second paragraph of the RPA conclusions, again, it is not expected that OCS development will itself promote additional refinery development in California.

    The Coastal Commission staff did not have access to the RPA and CEQ reports for this review. The draft statement would be more easily usable to assess California impacts if more of the materials from those reports dealing with California OCS development were included in the text itself.

20. Page 230. Table 83 is too sketchy to be very useful in measuring potential impacts on Northern California. It is hard to draw conclusions as to the range of economic, social, and environmental impacts of onshore development if no information is presented on the amount of oil in place, the possible rate of development, the actual location of the resource, the number of platforms thought possible, etc.

21. Page 233. Line 3: the CEQ report's point that primary industry need not develop adjacent to offshore production areas is an important one.

22. Pages 234-236. It is unclear why RPA studied the impacts on the San Francisco Bay area rather than those for the Southern California area, which is apparently scheduled for earlier development. Again, the Coastal Commission staff has not read the RPA report on the San Francisco Bay area.

23. Page 245. The discussion on employment impacts is getting at some important issues, and makes some good points. But we would like to see more area specificity for Southern, Central, and Northern California. Is Santa Barbara, for example, an "urban area?" Is OCS-induced development in California a "continuing activity," given the moratorium that has obtained for the past five years?

24. Page 281. Some mention should be made of the maneuverability and stopping distances of larger tankers, which will not be traveling at in-harbor speeds as they pass near some of the platforms; and mention should be made of the potential for spills of much greater magnitude using larger tankers.

25. Page 287, et seq. The regulations for OCS activities offsho of California should be consistent with and as stringent in all respects as the regulations and conditions set by the Division of Oil and Gas, the State Lands Division, the Coastal Commission, and other California agencies to govern operations on State lands offshore.

26. Page 293. Paragraph (2) Subsea: The statement "...it would appear axiomatic that the developer, from a purely economic standpoint would devise the safest, most reliable and long-lasting facility possible" is unfortunately belied by countless examples of economic short-cutting throughout the oil industry and other industries. Industry judgments as to "cost-effectiveness" will govern the commitment to environmental safety, reliability, and durability, and may well lead to greater risks than might be taken if environmental safety is the leading criterion.

27. Page 295. The last paragraph states that "use of tankers and barges to transport oil on the OCS will be severely limited to the collection of oil from well tests prior to pipeline installation." Exxon USA has explicitly stated that it will use tankers and barges to service production at the Santa Ynez unit if its plans for onshore facilities are not approved by State agencies. The same is true with regard to offshore oil storage (p. 296).

28. Pages 314-315. We concur with points presented in the last paragraphs of each of these pages pertaining to recreation usage in Southern California and esthetic impacts of platforms visible from the shoreline.

29. Page 316. This discussion presents conflicts with agricultural uses only. There are of course conflicts possible with many other activities and uses, as well.

30. Page 317. The final sentence of the page points out the California's populous areas are already stressed offshore by oil and other hazardous substances. Decisions as to OCS development should be made within the context of efforts to restore these marine areas.

31. Page 336. The Coastal Commission staff agrees that deepwater drilling is not a thoroughly tested activity, and that adequate testing should precede deepwater leasing. However, shallow

water leasing ought to proceed on the basis of resource potential, land use and environmental acceptability-- and not on the basis of meeting an arbitrary schedule of 10 million acres leased in 1975.

32. Page 340. Ideally, the accelerated leasing program would not proceed in California until completion of the Coastal Plan to be submitted to the Legislature in December, 1975; or until completion of a separately-funded study planning for OCS-related development conducted by the Coastal Commission.

Attachment No. 4
Specific Comments on the Draft Environmental Statement Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf (DES 74-90)
By State Lands Division, State of California

The following comments refer to items of the draft environmental statement.

1. In Volume 2, commencing on page 46 under (3) Ports and Shipping, major ports on the Pacific Coast are discussed. There is no mention of Humboldt Bay Harbor and Point Arena in these discussions and it is recommended that such harbors be included, especially in light of their proposed future roles as deep-water ports.

2. In Volume 2, commencing on page 276, under 1. Description of Impacts, oil spills from collisions resulting from increased tanker traffic are dismissed briefly. Available information suggests that the coastal waters off Southern California will have increased traffic lane congestion by the movement of crude oil, liquefied natural gas, refined products, and vessels traveling to and from platforms. It is suggested that a series of scenarios be developed which would statistically analyze the likelihood of an offshore accident in each case. A minimal condition scenario might discuss the potential impact resulting from Federal OCS oil production, while the maximum condition scenario might discuss the cumulative condition of tanker traffic from Alaska, movement of oil from State and Federal offshore leases, movement of refined products, imports and exports of crude oil, LNG tankers, shipment and involvement of upland production, and additionally, platforms in sea lanes. The probability of accident in each scenario should be calculated and mitigation measures to be employed should be discussed.

3. There also appears to be no discussion in the text regarding impacts resulting from accidental discharges of fluids other than crude oil which may emanate during tanker transport, such as gasoline, naptha, etc.

4. A discussion of secondary impacts from increased air pollution and water degradation should be included. Particular attention should be paid to air and water basin pollution allowances as proposed by the E.P.A. and how this may impact localities which need increased processing and refinery facilities.

5. The draft involves oil and gas leasing on an extremely large scale, and detailed descriptions of proposed oil and gas operations are included as part of reports covering specific areas. It would appear helpful to include at least a brief discussion of such operations within the draft.

STATE OF CALIFORNIA—RESOURCES AGENCY
RONALD REAGAN, Governor

DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS
5199 E. PACIFIC COAST HWY., SUITE 309-N
LONG BEACH, CALIFORNIA 90804

February 25, 1975

United States Department of the Interior
Bureau of Land Management "732"
Washington, D.C. 20240

Gentlemen:

The Draft Environmental Statement for the proposed increase in acreage to be offered for oil and gas leasing on the OCS has been reviewed by the Offshore Unit of this Division. No effort was made to evaluate the thoroughness of the report, we realize that a more detailed report is in progress for specific sites.

Comments are referenced by volume number, page number, and paragraphs and lines from the top:

Volume 1

P. 38, Para. 3, Line 1 - States that "platforms have been installed in the Gulf of Mexico in water depths to 373 feet," add and in the North Sea to 416 feet.

P. 60, Para. 1 - States that onshore specifications will be used for offshore pipelines. The design should consider the water environment, and an additional margin of safety should be added because of the added difficulty encountered when containing and repairing a leak.

P. 74, Para. 2, Line 1 - It should be indicated that only wells capable of flowing oil or gas are required to have subsurface safety valves installed.

P. 368 - Change the producing formation for Point Conception field from Alegria-Vaqueros (Oligocene-Miocene) to Sacate-Gaviota (Eocene-Oligocene), and add the Monterey Formation (M. Miocene) to South Elwood offshore field.

P. 381 - The last paragraph implies that oil production will always cause subsidence. Some of the conditions that are necessary to promote subsidence are unconsolidated sediments, thick zones, flat structures, and a large imbalance between fluid produced and fluid replaced into the reservoir either by natural influx or by injection. Of the 50+ fields in the Los Angeles basin, only three have subsided to any degree, and subsidence in one of these has been arrested by controlled water injection.

P. 393, Para. 3 - This discussion of California's oil and gas seeps should include a statement that describes the submarine seeps of the Santa Barbara Channel as probably the most prolific in the world.

Volume 2

P. 19, Para. 1 - This paragraph states that incoming population was forced to the coastal areas of California because agriculture became technologically intensive. This is not the primary reason and should be changed to indicate that migration to the coastal areas was because of the milder climate and better job opportunities.

P. 82 - Change the second to last line from a search for "cheap" to "cheaper" land has helped lend to the urban sprawl.

P. 93, Para. 2 - Last sentence implies that all produced refinery and oil field brines are dumped untreated into the harbor. A very small percent is being dumped and this is done only under strict requirements imposed by the Water Resources Control Board. Street run off and shipping should be added as major contributors to harbor pollution.

Para. 3 - Statement for paragraph 2 also applies to the first sentence of this paragraph. The second sentence refers to large submarine oil seeps in Ventura County. The large seeps are offshore from Santa Barbara County not Ventura. This should be changed to indicate that several onshore and submarine seeps in this area and migration of seepage oil from the Santa Barbara area contribute to the problem of the extensively used recreational beaches.

P. 94, Para. 2 - Add Santa Barbara to areas where bacterial contamination is evident. Santa Barbara City beaches have been closed at times due to city sewage contamination.

Para. 3 - The first sentence states that oil field waste waters and natural seeps are potential sources of oil pollution. Most oil field waste waters are injected into oil zones and the remainder is treated before being deposited into the sea, therefore pollution is potential only by accident or noncompliance. The natural submarine oil seeps of the channel are probably the most prolific in the world (100 bbl.+/day) and have been active for thousands of years. Oil field brines are potential sources and natural seeps are definite sources of pollution.

P. 166, Para. 2, Line 7 - States that low level continuous spillage occurs as a result of offshore oil operations. This statement is not correct for state operations where spillage rarely occurs and then only as a result of an accident or noncompliance.

P. 188, Para. 2 - States that oil spills will occur as a result of oil operations and birds will die. This statement is not accurate because no birds have died in California's State waters as a result of an oil spill from State regulated drilling or producing operations.

P. 194, Para. 1 - States that California kelp beds may suffer from an oil spill. The kelp beds have survived continuous flow from natural seeps and survived the massive spill of 1969.

Para. 2 - Deals with the effects of a 50,000 to 60,000 barrel spill of diesel fuel. Drilling and producing operations would not cause such a spill.

P. 201, Para. 3 - Deals with the effects of a Bunker C fuel oil spill. This could not result from drilling and production operations.

P. 222 - Map is not complete, hypothetical locations of possible oil and gas accumulations are not shown for the West Coast or Alaska.

P. 224 - Offshore production estimates for the West Coast are not included.

P. 233 - OCS development acreage as a percentage of the total OCS area in each region would be a useful comparison.

P. 263, Para. 4 - California's Water Quality Control Board normally requires effluents to contain less than 20 ppm oil compared to OCS Order No. 8 which allows 50 ppm.

The last two sentences imply that all produced brines have mineral concentrations exceeding sea water. Salinities of water produced from California's offshore fields range from about 11,000 to 31,000 ppm whereas the salinity of sea water is about 35,000 ppm.

P. 307 and 307a - Rather than using 10-year figures use the latest 5-year figures. As regulations, procedures and equipment have been improved the number of spills has declined. This improving record should be considered when making projections.

P. 308, Para. 2, Line 8 - Implies that following the Santa Barbara spill, beach equilibrium was adversely affected by sand removal. This seems unlikely, and such a statement should be documented.

P. 318 - The table listing major sources of oil pollution should include natural seeps.

P. 322, Para. 1 - States that onshore facilities and pipelines represent an irretrievable commitment of the land. Since pipelines and onshore facilities which support production operations will only be required until the production is depleted, they should be considered as temporary installations.

P. 353, Para. 3 - In this discussion of tanker spills it should be noted that shipping is the single greatest source of ocean oil pollution.

P. 394, Para. 2 - Thermal gradient energy generation may be more environmentally hazardous than most other sources of energy if it is pursued to the point that the present thermal equilibrium of the oceans is upset.

P. 398 - LNG imports are as embargo-prone and will effect balance of payments as much as oil imports.

P. 414 - Alternate lease bidding systems should include doing away with drilling under exploratory permits. This system has fostered a waste of capital because of duplicated effort, as well as secrecy and cheating because of the value of the information obtained.

P. 423 - Another alternative would be to allow agencies of bordering states to regulate the drilling and production operations on the OCS. Royalty sharing with bordering states and local governments should also be included as an alternative.

Sincerely,

John L. Hardoin

John L. Hardoin
Offshore Officer

JLH:vaa

SAN FRANCISCO DEPARTMENT OF CITY PLANNING 100 LARKIN STREET · SAN FRANCISCO, CALIFORNIA 94102

February 21, 1975

The Director (732)
Bureau of Land Management
U. S. Department of the Interior
18th and C Streets
Washington, D. C. 20240

Re: Your EIS DES74-90
Our EE74.324/NLA

Dear Sir:

The following comments on the Draft Environmental Impact Statement (EIS) for the Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf are submitted on behalf of the City and County of San Francisco.

As the Environmental Review Officer for the City and County of San Francisco, I administer the Office of Environmental Review which handles all environmental review for all agencies, departments and commissions of the City and County of San Francisco under California law. Since the passage of the Housing and Urban Development Act of 1974, we are now also implementing the National Environmental Policy Act (NEPA). I have a Bachelor's Degree in Chemistry, a Ph.D. in Zoology and 25 years of experience in research, teaching, consulting and administration.

The first comment that I would like to make about this EIS concerns its excess length. The purpose of an EIS is to convey information to the public and to decision makers. The more important, the more far-reaching, the nature of the subject which is being discussed, the more important it is that the content of this EIS be accessible to the general public. I very much doubt that either the general public or the decision makers will read a 1300 page report. I, myself, must admit that I have not had the time to read the entire report and have read only portions of Volume 2, on the assumption that some people may not have gotten that far.

I would like to make some general comments about the format and style of this document. It contains unstated assumptions in numerous places: for example, Page 5* states "The generalized zonal pattern described here is essentially a summary of observations of a semi-protected coastal situation." On what basis was this selection made? Was a single typical site analyzed?

*All page references are to Volume II and it is assumed that the various handwritten page numbers are to be ignored in favor of the printed numbers.

Page 37 cites 1968 data for "Oregon Coastal Recreation visitors." What is the evidence that there has been no significant change in the number of visitors in six years? I am under the impression that Oregonians have been concerned about a marked increase in visitors to their state in this period.

Page 159 states: "Pipelines crossing beaches and wetlands cause short-term one time effects...". These effects will be short-term only if the pipe contents will be at ambient temperature. This assumption is not stated. It may be a reasonable assumption, but in the absence of factual justification this cannot be evaluated.

Page 187: "The magnitude of impacts are impossible to predict; however, the experience in the Gulf of Mexico with commercial finfish and shellfish catches indicates no diminution in total catch or catch per effort." The implication is that it is safe to assume that California fisheries will be similarly unaffected. What is the rationale for this assumption? The ocean ecology of the California coast differs from that of the Gulf of Mexico. What assumptions have been made to justify extrapolation from one to the other? No information is given about the economic role of fisheries in California. What is the potential economic impact if the assumption is incorrect and there is a significant effect on the catch?

San Francisco is particularly concerned about its crab catch. The fishery data in this document seems to date back to a 1971 document. It was already known in 1971 that the crab catch was going down. Since then it has gone down even further. We do not know why the crab catch has gone down; it is suspected that this is a pollution-related problem. We are not anxious to see another unknown factor introduced off the Pacific coast until we have some understanding of the present problems.

On Page 188 there is a statement that "unique environments would suffer no greater or lesser impact than other areas." Perhaps - I would like to know what assumptions go into making such a statement. I can see many reasons why a particular, unique area might have ecological conditions such that the impact would be quite different if something were to happen there, rather than in another place. The relative sensitivity of the organisms inhabiting different ecological niches determines the degree of impact.

There is another kind of assumption that is made in this document, and that is assumptions as to the knowledge of the readers.

For example, in the section on the use of coal, it says "recoverable reserves of coal include at least 28 billion tons of 1% or less sulfur content" (page 365). There is no explanation of what the significance of this level of sulfur content is. I presume, therefore, that the assumption is that the reader knows whether this represents a high, a low, or a medium sulfur content, and what the significance of varying sulfur content of coal is for the environment. There is certainly no information in the document to enable the reader to understand the significance of this statement.

The general public does not have a technical education. Many portions of this document I doubt could be comprehended by a person without a technical education. Terms such as "purse seining" - page 13, "gill netting" and "surface jigs" - page 16, "urban impacted area" - page 28, "safe profiles" - page 30, "active sand dunes" - page 33, "LC 50 test" - page 174, "industrial groundfish" - page 269, "sour crude" - page 369, "heat wheels" and "heat-pipe" - page 383, and many others are found throughout this document without any definitions.

Consider the following sample sentence from page 193: "In this paper Sanders concluded that species density patterns for polychaetes, gastropods,bivalves and ampeliscid amphipods which are residents of the subtidal benthos, exhibit stress patterns dependent on distance from the spill and time of exposure of organisms to the fuel oil." I wonder how many readers of this document are going to be able to unscramble that and how many people are going to be willing to go to a dictionary to look up the number of terms in that one sentence that they are unfamiliar with. They will simply read on.

An EIS is not supposed to be written as a statement from one technical expert to another. It is supposed to be an explanation of technical issues to non-technical people who must be involved in the decision-making process. If the technical language is not translated into lay language, then this objective of the EIS is not attained.

I have familiarity with a variety of technical disciplines, yet I am at a loss to interpret the reference on page 159 to "sublethal description of physiological or behavioral activities."

There are unsupported assertions in this document. For example, page 14: "Until the late 1940's the Pacific sardine was an extremely important fishery in the California Current." No figures are given to back up this statement. Page 16: "...foreign fisheries have decreased the stocks of the more popular species." No supporting facts are presented nor is any reference given to a source of further information. Page 95: "...all of which resulted in tremendous economic loss to this recreational area." No substantiation is presented for this statement.

On page 172 there is a statement that"It is our conclusion that the effect of increased turbidity would be immeasurably small at more than a few feet from the point of discharge." What is "immeasurably small"? How is it being measured? What are the limits of the technique? These are presumably factual matters which could easily have been included to substantiate the statement and make it clear.

Further unsupported assertions are - page 186: "Plankton populations and productivity in the Gulf of Mexico have not shown any dramatic shifts in the last 25 years...". No data is presented. Page 188: "If birds were the sole concern during oil spills, dispersants and sinking agents would also mitigate the impact on birds but dispersants affect oceanic biota in being more toxic than the spilled oil." According to staff of the International Bird Research and Rescue Team (Berkeley, California; telephone (415) 841-9086), there is no evidence known to them that dispersants mitigate the impact of oil on birds. They and I would like to see documentation to support this statement. Page 269: "...shrimp (the most valuable fishery in the U.S.)...". No documentation given.

I would be curious to know what the source of information was for some of the biology of California. As someone who has spent a great deal of time along the California coast, I assure you that the rattlesnake is not the commonest snake along the Southern or the Central California coast. Rattlesnakes don't like the kind of climate we have along the California coast; they are found in the dry parts of California and my opinion in this matter has been confirmed by Mr. Rich Lacer of the California Academy of Sciences who says that it is not the rattlesnake but the garter snake which is the common snake along the California coast south of Sonoma County.

The information on California endangered species in the table on pages 209-211 presents a number of problems. The San Francisco garter snake is listed as an endangered species found in San Francisco. I regret to report that for some years the San Francisco garter snake has been extinct in San Francisco County; it is found only in San Mateo County. This fact could easily have been ascertained by looking at the 1 October 1973 U. S. Code (Title 50, Part 17) where it is stated that the present habitat for this endangered species is in San Mateo County, or by consulting a January 1974 publication by the

California Department of Fish and Game (At The Crossroads 1974: A Report on California's Endangered and Rare Fish and Wildlife). Checking either one of these documents would have made it abundantly clear that the list of California endangered species does not match any current document which was available at the time of preparation of this EIS. In checking the reference I find that the source of information was an EIS prepared by the Department of the Interior on the prototype oil shale leasing program. This is a secondary reference; there are many secondary references in this document and the numerous mistakes in the table are typical of the type of error that occurs when primary references are not used. The statement may have been accurate in terms of the lists of the endangered species available at the time that the document referred to was prepared; it is not accurate now and it was not accurate at the time that this EIS was published.

Other information about California appears to be equally accurate. The bacteriological objective referred to on page 97 as adopted by the Regional Water Quality Control Board was actually adopted in 1949 or 1950 (according to Dr. Teng Chung Wu, Chief of Surveillance and Analysis of the Regional Board), some years prior to creation of the Regional Board system.

The "recently enacted legislation" referred to on page 98 is the McAteer-Petris Act which was passed in 1965. The impact of 10 years implementation of this legislation has been substantial. Bay Area residents do not think of this legislation as recent.

Specific technical errors include the following: on page 7, paragraph two, all the examples of attached algae listed are animals; page 8, "Kelp and other algae and plankton", plankton includes other algae; boric acid is not a gas (page 109); Prasinophyceae is not an order (page 163); and most of the sulfur in coal is inorganic, not organic as stated on page 366.

Page 96 repeats a common error when it states that "Widely fluctuating levels of dissolved oxygen observed in areas of limited circulation in San Francisco Bay and in adjacent coastal areas have been attributed to algal growths. These growths have caused complete lack of dissolved oxygen in the extreme reaches of some tidal sloughs, creeks and rivers...". Algae, being plants, are photosynthetic, hence produce oxygen in the light. The oxygen consumed by dark respiration is a small fraction of the net oxygen produced in the light. Most oxygen problems occur when prolific growths of algae exhaust a required nutrient and massive die-offs occur. Oxygen-consuming bacteria and fungi then proliferate to decompose the dead algae and it is these decomposers which deplete the dissolved oxygen supply.

Some subjects which should be covered are not discussed in this EIS. I was unable to find any section discussing the general chemistry and physics of crude petroleum and the comparative toxicology of its various fractions and components. Such a discussion would seem to be necessary as a framework for evaluation of the potential impacts of oil spills. Some statements in the EIS cannot be meaningfully interpreted in the absence of such information. On page 163, this statement is found: "After an oil spill has occurred, that oil which has not evaporated, been carried ashore, or cleaned up will float at the surface for a time and eventually be dispersed as minute droplets in the water." On what basis is the reader expected to know what portion of the oil will evaporate, to evaluate the environmental significance of the resulting fractionation? Do the heavy, tarry fractions found in some crudes disperse as minute droplets or simply sink to the bottom? What is the expected range of chemical variation in the crudes from all the sites involved in this EIS? Page 165 refers to "Bunker C oil" without any explanation of its characteristics or their significance.

Page 195 presents the following statement: "Petroleum which contains a greater amount of aromatics are (sic) usually considered more toxic (R. C. Clark, 1973). However, both crude oils and their refined products contain compounds that are toxic to species of marine organisms (Ketchum, 1973)." The reader might happen to know what "aromatics" are but how, in the absence of any information on the expected aromatic content of the crudes to be tapped, would the judgment be made as to the impacts of aromatics in the development of off-shore oil deposits?

Other gaps include: no mention of the environmental hazards associated with polychlorinated biphenyls in heat exchanger fluids (page 166); inadequate discussion of potential heavy metal problems (page 180) (in view of the fact that California has most of the mercury ore deposits found in the United States and that substantial amounts of mercury from natural and gold-mining related sources have gone into the state's waterways which empty into the Ocean); and the total absence in the Mitigation chapter of a plan for continued toxicological and ecological studies designed to improve ability to predict impacts.

The document suffers from inadequate editing which results in illogical sequence and ambiguous meaning. What is the rationale for the sequence of items at the top of page 30? Why does the "Historical and Projected Economic Growth" section, beginning on page 65, use the sequence Oregon-Washington-California?

Chapter VIII, "Alternatives to the Proposed Action", presents a number of problems. In particular, Section F, "Energy Alternatives", fails to give a parallel discussion of the various alternatives, to evaluate the energy input-output relationship for anything other than pumped hydro (which is not an energy source but a management technique), or to cover adequately the environmental impacts of the alternatives.

Page 356 mentions nuclear stimulation of natural gas but gives no indication of the potential environmental consequences of this procedure. Page 357 states that: "Basic to all the forecasts is the assumption that economic and environmental benefits of nuclear power are such that it becomes the dominant technology for base load electric power generation at the end of the century." No mention is made of the facts that this assumption is not universally accepted and that plans for some nuclear power plants are currently being cancelled because of financing problems and changes in demand projections. Page 358 states that: "The fast breeder reactor (FBR) is expected to be in commercial use starting about 1988." Major cost estimate increases are leading to a reevaluation of the timing of this program. Present uncertainties should be clear and the source and date of the statement should be indicated.

The section on "Increased Nuclear Power" (page 357 et seq.) contains no discussion of the following: (1) problems of long-term storage of radioactive wastes with long half lives, (2) the hazards of illicit diversion of special nuclear materials, (3) operational reliability problems with current nuclear reactors, (4) the potential environmental consequences of accidents during transportation of special nuclear materials, (5) emission of radioactivity from reprocessing plants, or (6) the lack at this time of an operational reprocessing plant to serve existing U. S. nuclear installations.

The "Increased Energy Conservation" section (page 380 et seq.) states that: "Continued high rates of growth in energy demand must contend with eventual depletion of finite resources such as petroleum, natural gas, and uranium, and perhaps unacceptable environmental degradation.", but does not indicate that the probable rates for exhaustion of these resources differ or that estimates of exploitable uranium reserves depend on economic assumptions.

Although generally objective, this section does not clearly indicate the present technical feasibility of major energy conservation programs. The president of the American Society of Heating, Refrigerating and Air-Conditioning Engineers has recently stated that in Engineering News Record that "My colleagues in ASHRAE believe that from 25 to 50% of the energy consumed in heating, cooling and ventilating can be saved by the use of existing means to reduce fuel consumed and to recover wasted energy." The entire article is reproduced as Appendix 1 to this statement.

No comparative data are given to support the assertion on page 395 that: "Of the many applications of solar energy, few are cost competitive with other energy sources at the present time." The statement on the same page that: "These shemes (sic) would require large government research and development funds and subsidies." is presented without the appropriate context of past, present and projected governmental subsidy of other energy resources.

The section on "Geothermal Energy Production" (page 407 et seq.) indicates that the four types of geothermal sources are "hot water, vapor dominated, geopressured reservoirs, and hot dry rock systems," but does not explain what these are. The section does not cover chemical pollution problems other than salinity although significant boron toxicity problems have already arisen at existing California installations.

Examine the following sentence from page 17: "The most important clams of the area are the razor clam, butter clam, native littleneck clam, and manila clam, introduced from Japan." Does "introduced from Japan" refer to all items listed or only the last? Editing should have caught such a sentence. Note that pages 13 through 17 are repeated verbatim as pages 55-59. Proofreading would eliminate such statements as: "Few protected anchorages and good boat landings and very little possible water exist on any of the islands," page 32, or "Physiological stress would probably result from an osmotic imbalance (cells losing water to surrounding brine) and low or dissolved oxygen", page 171.

Editing would also have caught the numerous bibliographic problems such as: the page 31 reference to the "California State Park System Plan" which is not cited in the bibliography; the page 39 reference to the "Comprehensive Framework Study" which is not cited; the page 43 reference to "Washington State 1972" which is not cited; the page 46 reference to the "U. S. Census" which can only be identified in the bibliography by persons who know that the Bureau of the Census is under the jurisdiction of the Department of Commerce; the page 60 reference to "the U. S. Geological Survey released estimates" without citation of a specific domument; page 99 reference to "235 oil spills were reported" without citation of source; and the page 372 reference to the "Federal Power Commission, May 1974" when there are two Federal Power Commission, May 1974 entries on page 438 which have not been identified as 1974 a and b.

In conclusion I would like to say that if this document had been presented for review to my office it would not have been considered to be in a form suitable for publication as a draft, and we would have required extensive further editing, documenting and cutting.

Very truly yours,

Selina Bendix

Selina Bendix, Ph.D.
Environmental Review Officer

VIEWPOINT

ASHRAE pushes energy consumption cut of 25 to 50%

David Rickelton is president of the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. The group, which has a total U.S. and foreign membership of 30,262 with 123 chapters in the U.S. and Canada, is holding its semi-annual meeting in Atlantic City this week. Energy conservation design is slated as a major discussion topic.

No matter what this country's proposed energy development programs accomplish or fail to accomplish, there's one sure way to save energy, and that is to make better use of the energy and the technology already available.

It would take the opening of a major new coal mine every 48 days, plus drilling 114 new oil and gas wells a day for the next 10 years just to keep domestic production up to 1973 levels, it was recently pointed out by William Hulbert, Jr., president of the American Public Power Association. Then in order to replace the 1973 level of oil imports with domestic energy, it would take the opening of an additional major coal mine every 60 days, 31 more oil and gas wells a day, and an additional six large nuclear plants a year.

That's just to keep pace with 1973. In addition, the energy consumption growth rate has been averaging 3½% per annum over the past 25 years, and will so continue until conservation efforts reduce this figure to something more acceptable. From where can it all come? Since new energy supplies are not immediately available, we have to become more energy efficient.

I believe that a major area in which we can conserve energy and make better use of what we have is in the heating, ventilating, refrigerating and air-conditioning field. While waiting until objections to offshore drilling and nuclear powerplants have been met; while waiting for the development of solar, geothermal and windborne energy on a commercial scale; while waiting for refinement techniques of coal desulfurization, stack scrubbing and coal gasification; while waiting until the nation is less dependent upon the auto for transportation, we can address ourselves to the task of making our buildings more energy efficient now.

Inefficient use of energy surrounds us. Home oil burners run at efficiencies between 60 and 65%. Electric power is virtually 100% efficient after delivery to the site, but if one looks at the total picture, from the time fuel is burned to generate electricity, and then transported, the resource efficiency of electric energy is only 30%.

In New York City, Con Edison has long been using some of its by-product steam to provide heat for high-rise office buildings in mid-Manhattan. Thus, some of the 70% of the energy which would otherwise be lost is recaptured. In Germany they are now building powerplants to similarly capture conversion loss energy and heat whole villages with its steam. We will need to do more of this in the years to come.

Let's capture the heat that goes up the chimney of, say, a foundry, and rescue it for such purposes as heating the structure, providing hot water, and through the long-established principle of heat exchange, air-conditioning in the summer.

The heat pump deserves mention here. Able to heat and cool, heat pumps are capable of doubling the efficiency of electric energy delivered to the site.

For years we have been throwing away heat that accumulates in the cores of large commercial buildings. Recapturing this heat and reusing it for heating the building perimeters is a viable procedure. Cooling an office building's interior, which usually has to be cooled even in winter because the core acts as a central heat sink, by using outside air in winter is also a viable procedure.

Our efforts to increase the available amount of energy to the consumer to meet his space heating and cooling requirements must logically be supported by improved operating efficiencies and containerization. There are millions of buildings across our country that are virtual sieves, wasting and losing 25 to 50% of their heating and cooling energy.

The American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE), is finishing a document which will establish criteria and procedures intended to make all new buildings more energy efficient.

Referred to as Standard 90P, it covers building insulation, air leakage, levels of illumination, the efficiency of the building's electrical equipment, and many other components and systems of large structures.

The guidelines set up in Standard 90P will probably increase the initial cost of most buildings, but will pay dividends in terms of lower operating costs during the building's life and in terms of much needed energy conservation.

Naturally, there are more existing buildings than new ones to be built in the next few years. Once Standard 90P is finalized, ASHRAE intends to formulate guidelines of what can reasonably and efficiently be done to increase the energy efficiency of existing buildings, to improve systems and insulation and recover heat which is being thrown away.

The Department of the Interior tells us that in 1975 alone 6.6 million bbl of oil will be consumed by household, commercial, and industrial users (and 9.2 million bbl by transportation). My colleagues in ASHRAE believe that from 25 to 50% of the energy consumed in heating, cooling and ventilating can be saved by the use of existing means to reduce fuel consumed and to recover wasted energy.

That magnitude of savings represents 7½ to 10% of the total energy used in the U.S. and is equivalent to a 3 or 4-million-bbl oil savings per day.

Engineers and architects have the technology and experience today to keep heat inside buildings during the winter, out of them during the summer, and to improve building operating procedures to accomplish energy reduction.

What is needed now to make Standard 90P and its forthcoming companion effective is support from the government at all levels. Our people should be given tax and other incentives for making buildings energy efficient.

Energy optimization is the first step toward pulling us through the present period of shortage and, in the long run, toward making us independent of the oil-producing nations.

ENVIRONMENTAL IMPROVEMENT AGENCY
County of San Bernardino
316 Mt. View · San Bernardino CA 92415 · (714) 383-1718
ROBERT B. RIGNEY, Administrator
Environmental Improvement Agency

February 18, 1975

Department of the Interior
Bureau of Land Management
Director 732
Washington, D.C. 20240

RE: Comments on Draft Environmental Impact Statement - "Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf (OCS)"

Dear Sirs:

The Environmental Improvement Agency of San Bernardino County is primarily concerned about the secondary effects of OCS drilling; namely, air pollution created by a potential increase in refining activity, potential oil pipeline corridors and storage facilities, all of which we feel have not been adequately analyzed by the BLM's E.I.S.

Our southeastern California County is in a unique geographical position relative to the heavily populated regions of southern California. The ambient air quality of the South Coast Air Basin portion of the County exceeds federal and state oxidant standards mainly due to migrating pollutants from the west and southwest. The Southeast Desert Air Basin portion of the County is also suffering increased oxident intrusions, from the South Coast Air Basin, as evidenced by records from our Air Pollution Control District monitoring station in Victorville. Any increase in emissions in the South Coast Air Basin will be detrimental to the improvement of our air quality, even to federal or state standards. Present SO2 ambient levels are low, but an increase in refining activity could potentially create yet another air quality health hazard.

We are aware of at least five new major electrical transmission systems and one major natural gas pipeline proposed to originate in and/or traverse the County. Oil pipeline corridors passing through the County from coastal refineries and/or pumping stations to the eastern market will make an additional demand on our already over-taxed rights-of-way.

In light of the potential increase in air pollution and in transport needs that might affect San Bernardino County, we recommend the following:

Board of Supervisors
DENNIS HANSBERGER ....Third District
Chairman
DANIEL D. MIKESELL ....Second District
Vice-Chairman
JAMES L. MAYFIELD ....First District
ROBERT O. TOWNSEND ..Fourth District
NANCY E. SMITH ....Fifth District
ROBERT A. COVINGTON
County Administrative Officer

1. The OCS E.I.S. should include an in-depth analysis of indirect air quality impacts resulting from the very real possibility of increased refining activity. The emissions would add to the cumulative air resource degradation affecting all of southern California. The E.I.S. should include the impact of hindering the attainment of federal and state air quality standards in the South Coast Air Basin and the impact on the court-ordered federal goal of preventing our clean air areas from deterioration to those same standards. The E.I.S. should address the possible attempt to place refineries in the California Desert in order to utilize its relatively clean air if such additional emissions will not be allowed in the coastal or basin areas. Air quality considerations in the final OCS E.I.S. and in any other E.I.S. on actual site development should involve the Environmental Improvement Agency; especially the San Bernardino County Air Pollution Control District or any regional A.P.C.D. that might subsequently be established.

2. The County Environmental Improvement Agency is the primary County body authorized to deal with such issues. We request involvement in any environmental review or planning process in dealing with the consideration of, or actual preparation for, oil pipeline rights-of-way proposed to traverse our boundaries. Our input should be requested on a preliminary basis in order to better assess future impacts. We have recently begun our Joint Utility Management Program which involves such corridor planning. Communication to the County should be addressed:

   Robert B. Rigney, Administrator
   Environmental Improvement Agency
   316 Mt. View Avenue
   San Bernardino, CA 92315

In addition, we believe the final OCS E.I.S. should expand the following topics:

1. Increased OCS drilling as a factor in the national energy program.
2. Changes in demand due to existing conservation measures.
3. Accelerated conservation and energy efficiency controls as the cheapest and quickest methods of alleviating shortages.
4. The effect of increased future supplies from Alaskan oil fields.
5. Increased recovery in existing fields.
6. Quicker implementation of alternate energy sources which we will have to utilize in the future anyway.
7. Impacts on local government.

8. All direct and indirect impacts, as mandated by the National Environmental Policy Act.

9. For future use, the BLM should begin a cost/benefit analysis of the over-all energy and resource efficiency of transporting crude oil vs. refined oil derivatives via pipeline.

We wish to work with the BLM or any other lead agency in assessing the various indirect OCS leasing and drilling impacts that affect our area of jurisdiction.

ENVIRONMENTAL IMPROVEMENT AGENCY

Robert B. Rigney

Robert B. Rigney
Administrator

CHB:RBR:th

cc: Chairman, Board of Supervisors

COMPREHENSIVE PLANNING ORGANIZATION OF THE SAN DIEGO REGION

CPO

SUITE 524
SECURITY PACIFIC PLAZA
1200 THIRD AVENUE
SAN DIEGO, CALIF. 92101
(714) 233-5211

January 7, 1975

Director, Bureau of Land Management
United States Department of the Interior
Washington, D.C. 20240

Subject: CPO Executive Committee Action
Re: Draft EIS on Offshore Oil Drilling

Dear Sirs:

At its January 3, 1975, meeting, the Comprehensive Planning Organization Executive Committee determined that the subject project is of regional planning significance.

In accordance with the National Environmental Policy Act, the staff of CPO wishes to review this proposed project in detail. Areawide Clearinghouse procedures allow for a 30-day review period following submission of the completed draft Environmental Impact Statement (EIS) to the Metropolitan Clearinghouse.

CPO staff is in receipt of the draft EIS and will begin formal review by contacting your agency and any others which might have an interest in or be affected by the proposed project to determine whether it is consistent with regional environmental objectives.

If you have any questions regarding the review procedure, please do not hesitate to contact Arthur Letter at the CPO office: 714-233-5211, extension 64.

Sincerely,

Richard J Huff

RICHARD J. HUFF
Secretary

RJH/sh

cc: H. Tipton
County Intergovernmental Relations

MEMBER AGENCIES: Cities of Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Escondido, Imperial Beach, La Mesa, National City, Oceanside, San Diego, San Marcos, Vista, and County of San Diego / *EX-OFFICIO MEMBER:* California Department of Transportation / *HONORARY MEMBER:* Tijuana, B. CFA.

COMPREHENSIVE PLANNING ORGANIZATION OF THE SAN DIEGO REGION CPO

Project Notification

Item No.: NI-FY75-84 thru NI-FY75-98

Date 1/3/75

TO: Executive Committee

FROM: Executive Director

SUBJECT: Project Notifications Submitted to Metropolitan Clearinghouse December, 1974

The following Project Notifications have been received by CPO during the month of December in accordance with O.M.B. Circular A-95.

NI-FY75-90: Offshore Oil Drilling, Draft EIS/U.S. Department of the Interior — Review

Reviewed Pursuant to: National Environmental Policy Act

The U.S. Department of the Interior has submitted a Draft Environmental Support Statement (EIS) on a proposal to lease 10,000 acres on the United States outer continental shelf (OCS) in the Atlantic, Gulf of Mexico, Alaska and Pacific regions during 1975 to increase domestic extraction and production of oil and gas. The EIS concerns the environmental implications of this major federal action, together with a discussion of various alternative actions and mitigating measures that could be adopted. The document gives a generalized description of both the offshore, nearshore and coastal environments in the Pacific region and expected impacts on these coastal zones from oil and gas operations. No specific acreages are defined for leasing. Specified individual leases could be subject to more detailed EIS's prior to final action on them.

An effort is currently being made by concerned local governments in California including San Diego County to provide funds for independent reviews of this and subsequent EIS's on specific lease sites under the auspices of the National Academy of Sciences using the resources of the Scripps Institute of Oceanography.

Since no specific lease areas have been pinpointed, the possibility exists that there may be leasing proposed in areas that could affect the region's coastal environment. Due to the significant potential environmental and economic impacts, it is recommended that the full CPO Board of Directors review this project.

The Resources Agency of California

The Resources Agency compiled the comments of several State agencies (listed on page 1 of its comments). Inasmuch as the Department has already responded to the approximately 500 page document submitted by the Southern California Council of Local Governments, which incorporated many of the comments of the Coastal Zone Conservation Commission, the following responses will be cursory, not because they are not substantive, but in the interests of proximate duplication. The same holds true for the comments submitted by the Division of Oil and Gas, the City of San Francisco, the San Bernardino County Environmental Improvement Agency, and the Comprehensive Planning Organization of the San Diego Region.

Disposition

1. Many of these comments on possible impacts on water quality are more detailed than the scope of this program EIS permits. Many of these issues are discussed in the draft site-specific EIS on the sale proposed in Southern California.

2. The tentative leasing goal has been modified so that specific acreages are no longer included in the proposal. Rather, the Department proposes to accelerate OCS leasing by conducting six lease sales per year through 1978. No acreage targets are included.

3. Again, most of this discussion from the draft EIS is moot because

of the publication of a tentative leasing schedule which advances the proposal of conducting six lease sales per year through 1978; specific acreages have been eliminated from the proposal.

Potential environmental impacts are described and quantified to as good a level as our historical information permits. Maximum impacts are generally recognized for each major resource category.

Historical Preservation - It is our understanding that such contact was made by the California OCS office during the preparation of the site-specific EIS in Southern California.

Department of Fish and Game and the Coastal Zone Conservation Commission comments duplicate in large part comments found in the document prepared by the Southern California Council of Local Governments.

Because of major duplication of thrust of comments, specific responses to the remainder of the State and local agencies' comments have been omitted. Reference is made to the S.C.C.L.G. document mentioned in the previous paragraph, as well as the numerous comments addressed elsewhere in this Section IX.

Pages 703 through 710 are missing due to a pagination error.

704

STATE OF DELAWARE
DEPARTMENT OF STATE
DIVISION OF HISTORICAL & CULTURAL AFFAIRS
SECTION OF ARCHAEOLOGY
R.D. #2 BOX 126
MILFORD, DELAWARE 19963

RONALD A. THOMAS
Archaeology Supervisor

DR. RONALD M. FINCH
DIRECTOR

January 8, 1975

United States Department of the Interior
Bureau of Land Management
Washington, D.C. 20240

Gentlemen:

I would like to enter the following statement to be considered during public hearings on the "Proposed Increase in Acreage to be Offered for Oil and Gas Leased on the Outer Continental Shelf".

It does not appear that enough concern was given to possible destruction of prehistoric human habitation sites that are known to exist on the outer continental shelf of the Atlantic seaboard. I would urge that the final Environment Impact Statement also address itself to this problem. It is expected that some of the earliest evidences of human activity in the New World will be found in these areas. The loss of this information would certainly affect our understanding of prehistoric man in the new world.

Sincerely yours,

Ronald A. Thomas

Ronald A. Thomas
Archaeology Supervisor

RAT/agf
cc: Mr. R.H. MacPherson, Delaware State Planning Office

State of Delaware
DELAWARE GEOLOGICAL SURVEY
UNIVERSITY OF DELAWARE
Newark, Delaware
19711

ROBERT R. JORDAN, STATE GEOLOGIST
101 PENNY HALL
PHONE: 302-738-2833, 2834

February 17, 1975

Office of the Director
Bureau of Land Management
U. S. Department of the Interior
Washington, D. C. 20240

Dear Sir:

In accordance with provisions stated in the announcement of hearings on "Proposed Increase in Oil and Gas Leasing on the OCS" I am enclosing a copy of my testimony which was presented on February 11 at Trenton, New Jersey. Inclusion of this statement should complete the record of my testimony at that hearing.

Sincerely,

Robert R Jordan

Robert R. Jordan
State Geologist

RRJ:mac

Enc.

Statement of Robert R. Jordan, State Geologist of Delaware, to Bureau of Land Management Hearing, Trenton, New Jersey, February 11, 1975, Subject:

PROPOSED INCREASE IN OIL AND GAS LEASING ON THE "OUTER" CONTINENTAL SHELF

It is worthy of note at the outset that the proposed action derives from a Presidential directive issued in January 1974 to lease ten million acres of continental shelf area and that the Draft Environmental Statement begins by indicating the necessity to offer possibly twenty million acres in order to meet that objective. Since the publication of the document, there have been various indications by the Department of the Interior that the actual acreage to be leased will be dependent upon the outcome of this and subsequent similar proceedings. This appears to be contradictory and is an immediate indication of the vague nature of the target to which we are asked to address comment.

Ignoring this, however, the announcement of this hearing calls specifically for comment on such matters as the environmental impacts, adverse effects, geologic conditions affecting safety and pollution, and economic benefits of the proposed policy. It is exceedingly difficult to address such matters with technical accuracy given the vague nature of the proposed policy and, in particular for my purpose, the minimal geologic information provided.

Ninety-four percent of the area of the State of Delaware lies within the geologic province known as the Atlantic Coastal Plain. The seaward extension of that province which at this instant of geologic time happens to be covered by the waters of the Atlantic Ocean comprises the Atlantic Continental Shelf. The differentiation between the Coastal Plain and the shelf is marked only by the position of the transient shoreline. The differentiation between the Atlantic Continental Shelf and the "Outer Continental Shelf" is even more tenuous - merely an artificial construction of legal terminology. Our State is naturally and inextricably bound to the geologic conditions, benefits and disadvantages both, that our location on the continent imposes upon us. This natural relationship gives rise to some of our concerns about the proposed action and little appreciation of the facts of the matter are found in the Draft Environmental Statement which I fault because it contains too little information about the geology of these interrelated provinces and, indeed, concentrates what minuscule and elementary data it does contain on the "outer" artificially separated portion.

The amount of geologic information available about the deeper portions of the Atlantic Continental Margin is appallingly small. We do not know whether any resource exists, much less its magnitude, or its location, or its composition. With no data base we are, however, asked to respond specifically to the consequences of commitment to production and utilization of a hypothetical resource. To a scientist this involves guesswork of an unacceptable nature.

It is evident that the results of any activity dealing with oil and gas on the Atlantic Shelf will be profound and extremely profound in view of the massive nature of the proposed action which, in addition to committing enormous areas, would set in motion a questionable way of doing business involving both exploration and exploitation.

Responding to such a proposal in this context is akin to blindly describing the proverbial elephant, but worse in that we are expected to determine its internal as well as external characteristics and also to predict its behavior and the consequences of that behavior.

Given that all parties concerned with the proposed action are sincerely interested in making wise and proper decisions in this important and complex matter, two actions involving geologic information should be considered. Neither will delay possible ultimate derogation of benefits from the province and they will greatly enhance our ability to judge the consequences of the proposed actions.

1. Increased accessibility of geologic and geophysical information pertinent to the oil and gas potential of the Atlantic shelf and its environmental implications is badly needed. At this time the very information that forms the basis for the proposed action is largely secret. These secrets are, evidently, shared in part between private industry and the Department of the Interior, but are not available to the States which will bear the brunt of decisions based upon them. Surely the investments and rights of the private sector can be protected and yet permit the localization of points of impact and description of possibly critical subsurface conditions so that the questions raised by this hearing can be addressed from a basis in factual knowledge.

2. The nature of oil and gas resources of the Atlantic Shelf, and whether any in fact are present, can only be determined by drilling. The accuracy of judgments about the consequences of production and the most prudent utilization of any resources will be immeasurably increased if the information to be gained by controlled exploratory drilling with serious and effective environmental safeguards can be generated separately

from a commitment to produce. Here again it would seem that the investment of the explorer could be protected while assuring much more adequate preparatory and protective measures resulting in more beneficial uses of the resource.

If it is in the national interest to drill the shelves it must also be in our interest to proceed in the most informed manner possible. This may require some changes in the way that business is done in the offshore area, but certainly the potential benefits warrant action on these points. It is unfortunate that the Draft Environmental Statement merely mentions the possibility of generating a better data base and developing improved leasing arrangements but does not even dignify such points by informed discussion.

The proposed action and the document that purports to justify it are found to be deficient in fundamental technical information and, moreover, deny the possibility to improve on that condition. The ill-defined but massive action proposed would result in similarly ill-defined but massive consequences which, lacking further information, must be regarded as seriously negative.

As a State Geologist I find that I am compelled by earlier uninformed comment from the panel to make the following addition to my testimony:

As a result of Secretary Morton's unfortunate allegation concerning consulting by State Geologists for oil companies at a meeting of Atlantic Governors at Princeton, New Jersey, on January 31, 1975, the Association of American State Geologists has polled the State Geologists of the Nation on that point. The result of the poll clearly refutes the statement that State Geologists consult for oil companies. The Association has presented the facts in writing to the Secretary and is allowing an appropriate time for him to respond. We would have preferred to permit the Secretary the opportunity to consider the facts in gentlemanly fashion, however, a similar charge has been repeated here today and I must inform you that it is simply not true.

Note: Due to the press of time some deviations from the exact wording of this statement were made in the oral presentation.

State of Delaware

Comments were submitted by the State of Delaware's Division of Historical and Cultural Affairs, and the Delaware Geological Survey. They are addressed separately below.

Disposition

Division of Historical and Cultural Affairs

A general stipulation has been developed which will apply to all leases that requires an archeological survey be conducted and submitted along with any development plans. In the Gulf of Mexico, areas are first prioritized as regards their likelihood of containing valuable artifacts of previous civilization; these areas are then examined more closely using specialized equipment.

Delaware Geological Survey

The comments submitted are those presented by the State Geologist at the Trenton hearing in February, 1975. The two significant points raised concern increased accessibility of geologic and geophysical information, and controlled exploratory drilling. New regulations concerning geological and geophysical surveys have been proposed by the USGS; they are attached to this volume. Various types of controlled exploratory drilling are addressed as alternatives to the proposed program in Section VIII. The remainder of the State Geologist's comments reflect upon the lack of data and information which the Department of the Interior is proceeding on. The Department concurs that lack of information makes program formulation difficult; but some lack of information is part and parcel of wildcat drilling, and that private industry is best equipped to undertake the attendant economic risks.

STATE OF FLORIDA

Department of Administration

Division of State Planning

660 Apalachee Parkway - IBM Building

TALLAHASSEE

32304

(904) 488-2371

Earl M. Starnes
STATE PLANNING DIRECTOR

Reubin O'D. Askew
GOVERNOR

L. K. Ireland, Jr.
SECRETARY OF ADMINISTRATION

February 26, 1975

Mr. Curt Berklund, Director
U S Department of Interior
Bureau of Land Management
Washington, D. C. 20240

Dear Mr. Berklund:

Functioning as the state planning and development clearinghouse contemplated in U. S. Office of Management and Budget Circular A-95; we have reviewed the following draft environmental impact statement:

USDI - BLM - Outer Continental Shelf (OCS) Oil and
Gas Leasing, Proposed Increase in Acreage DES 74-90
SAI: 75-0637E

During our review we referred the environmental impact statement to the following agencies, which we identified as interested: Board of Trustees of the Internal Improvement Trust Fund; Department of Commerce; Department of Natural Resources; Department of Pollution Control; Department of State - Division of Archives, History and Records Management; Environmental Information Center and Game and Fresh Water Fish Commission. Agencies were requested to review the statement and comment on possible effects that actions contemplated could have on matters of their concern. Letters of comment on the statement are enclosed from the Department of Natural Resources; Department of Pollution Control and Game and Fresh Water Fish Commission. The Department of Commerce reported "no adverse comments" by telephone. No further responses were received.

In accordance with the Council on Environmental Quality guidelines concerning statement on proposed federal action affecting the environment, as required by the National Environmental Policy Act of 1969, and U. S. Office of Management and Budget Circular A-95, this letter, with attachments should be appended to the final environmental impact statement on this project. Comments regarding this statement and project contained in the letter from the Department of Pollution Control should be adequately addressed in the statement.

We request that you forward us copies of the final environmental impact statement prepared on this project.

Sincerely,

E. E. Maroney

E. E. Maroney, Chief
Bureau of Intergovernmental Relations

EEM/Emt
CC: William Partington
Jay Landers
Harmon Shields
Don Spicer
Dr. Tim Stuart
H. E. Wallace
Robert Williams
Estus Whitfield

DIVISION OF [illegible]
1975
SAI NO.

STATE OF FLORIDA

Department of Administration

Division of State Planning
660 Apalachee Parkway
TALLAHASSEE
32304
(904) 488-2371

Earl M. Starnes
STATE PLANNING DIRECTOR

Reubin O'D. Askew
GOVERNOR

L. K. Ireland, Jr.
SECRETARY OF ADMINISTRATION

TO: Mr. Harmon Shields, Ex. Director
Department of Natural Resources
Larson Building
Tallahassee, Florida 32304
Attn: Mr. Jim Smith

DATE: DEC 18 1974

DUE DATE: JAN 1 1975

FROM: Bureau of Intergovernmental Relations

SUBJECT: SAI: 75-0639 E

The attached "Advance Notification" of intent to apply for federal assistance is being referred to your agency for review and comments. Your review and comments should address themselves to the extent to which the project is consistent with or contributes to the fulfillment of your agency's plans or the achievement of your projects, programs, and objectives.

If further information is required, you are urged to telephone the contact person named on the notification form. If a conference seems necessary, or if you wish to review the entire application, contact this office by telephone as soon as possible. If you have no adverse comments, you may wish to report such by telephone. Please check the appropriate box, attach any comments on your agency's stationery, and return to IGR or telephone by the above due date. In both telephone conversation and written correspondence, please refer to the SAI.

Sincerely,

Ed Maroney

Chief
Bureau of Intergovernmental Relations

Enclosure

****

TO: Bureau of Intergovernmental Relations

FROM: Department of Natural Resources

SUBJECT: Project Review and Comments

☐ No Comments

☒ Comments Attached

Reviewing Agency:

Signature: James E. Smith

Date: 1/27/75

Title: Administrative Assistant

State of Florida

REUBIN O'D. ASKEW
Governor
BRUCE A. SMATHERS
Secretary of State
ROBERT L. SHEVIN
Attorney General
GERALD A. LEWIS
Comptroller
THOMAS D. O'MALLEY
Treasurer
DOYLE CONNER
Commissioner of Agriculture
RALPH D. TURLINGTON
Commissioner of Education

DEPARTMENT OF NATURAL RESOURCES

ARMON W. SHIELDS
Executive Director

CROWN BUILDING / 202 BLOUNT STREET / TALLAHASSEE 32304

January 27, 1975

Mr. Edgar E. Maroney, Chief
Bureau of Intergovernmental Relations
Division of State Planning
660 Apalachee Parkway
Tallahassee, Florida 32304

Dear Mr. Maroney:

Reference is made to your memorandum of December 18, 1974, requesting Department staff review of SAI No. 75-0639E -- Draft Environmental Statement: Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf. The Department staff has reviewed referenced draft environmental statement.

Although the leasing is out of the area of jurisdiction of the Department of Natural Resources, production would entail movement of oil and gas across areas of interest to the Department, especially in the coastal zone area. The Department staff anticipates that consideration will be given to Department recommendations and comments when and if site selections of pipeline corridors are to be made by those companies actually placing leased lands into oil and gas production.

The Department staff looks forward to working with all federal and state agencies having an interest in this matter.

Sincerely,

James G. Smith
James G. Smith
Administrative Assistant

JGS:rt

DIVISIONS / ADMINISTRATIVE SERVICES · ENVIRONMENTAL RESEARCH AND PROTECTION · INTERIOR RESOURCES
MARINE RESOURCES · RECREATION AND PARKS

STATE OF FLORIDA

Department of Administration

Division of State Planning

660 Apalachee Parkway - IBM Building

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STATE PLANNING DIRECTOR

Reubin O'D. Askew
GOVERNOR

L. K. Ireland, Jr.
SECRETARY OF ADMINISTRATION

PLANNING
JAN [illegible] 1975
SAI NO

TO: Mr. H. E. Wallace
Game and Fresh Water Fish Commission
Bryant Building
Tallahassee, Florida 32304

DATE: DEC 18 1974

DUE DATE: JAN 1 1975

FROM: Bureau of Intergovernmental Relations

SUBJECT: SAI: 75-0639E

The attached "Advance Notification" of intent to apply for federal assistance is being referred to your agency for review and comments. Your review and comments should address themselves to the extent to which the project is consistent with or contributes to the fulfillment of your agency's plans or the achievement of your projects, programs, and objectives.

If further information is required, you are urged to telephone the contact person named on the notification form. If a conference seems necessary, or if you wish to review the entire application, contact this office by telephone as soon as possible. If you have no adverse comments, you may wish to report such by telephone. Please check the appropriate box, attach any comments on your agency's stationery, and return to IGR or telephone by the above due date. If we do not receive a response by the due date, we will assume your agency has no adverse comments. In both telephone conversation and written correspondence, please refer to the SAI.

Sincerely,

Ed Maroney
Chief
Bureau of Intergovernmental Relations

Enclosure

****

TO: Bureau of Intergovernmental Relations
FROM:
SUBJECT: Project Review and Comments, SAI: 75-0639E

☒ No Comments
☐ Comments Attached

Reviewing Agency:
Signature: Bradley J. Hartman
Date: 1/14/75
Title: Assistant Section Leader

STATE OF FLORIDA
DEPARTMENT OF POLLUTION CONTROL
2562 EXECUTIVE CENTER CIRCLE, EAST
MONTGOMERY BUILDING
TALLAHASSEE, FLORIDA 32301

PETER P. BALJET
EXECUTIVE DIRECTOR

DIVISION OF STATE PLANNING,
Bureau Of
Intergovernmental Relations
JAN 19 1975
W.D. FREDERICK, JR.
CHAIRMAN
RECEIVED
SAI NO.

January 15, 1975

RE: SAI: 75-0639E
Draft Environmental
Statement
Proposed Increases in
Acreage to Offer for
Gas and Oil Leasing on
Outer Continental Shelf
Dept. of Interior

Mr. E. E. Maroney
Bureau of Intergovernmental
Relations
Department of Administration
Division of State Planning
660 Apalachee Parkway
Tallahassee, Florida 32304

Dear Mr. Maroney:

The "Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf" has several critical deficiencies which are either ignored or inadequately considered in DES 75-0639E. The document does not present a reasoned evaluation of merit of proposed actions.

Major criticisms of the proposed action fall into several distinct, but often overlapping, general categories. Questions considered herein are in the general areas of 1) economics, 2) industry capability, 3) Governmental preparedness, 4) need for the proposed action, and 5) Environmental impacts.

1. Economics:

The DES fails to consider response options available to industry. The economics of OCS oil and gas, and the business maxim of profit maximization, will most likely lead to joint ventures aimed at areas of greatest potential. Such joint efforts may well lead to the effective exclusion of smaller firms and a resultant undesirable monopolization by the majors.

Further, a limited market flooded with tracts of reasonably high potential can only result in reduced unit returns, since all tracts purchased must draw from the same capital pool. The characteristic undervaluation of offerings by the Department of Interior encourages speculative acquisitions and may well insure less than maximum returns from the leased acreage.

The DES also fails to assess market demand for the increased acreage offering. If demand has been satisfied at historic leasing rates, a sudden glut of offerings will be effectively available only to those operators with the largest capital surpluses. The deferred bonus leasing option considered in the DES addresses this problem of exclusion of minors, but fails to recommend any resolution.

Economic impacts of land based operations resulting from an OCS "find" in a frontier area are also inadequately addressed. Consideration of such impacts, as indicated in the DES, is properly a concern for EIS's aimed at individual sales. It is also, however, regional in nature, and therefore must be considered at the programmatic level.

2. Industry Response Capability:

Economic response options available to industry were briefly considered above. The response capability referred to here concerns manpower and equipment availability. Data presented by industry in relation to OCS Sale Number 32 very clearly indicated that then existing manpower and equipment pools would be strained to their utmost to approach the claimed three year lag time limit from lease to production. Subsequent Gulf of Mexico sales (numbers 37 & 38) as well as any increased over the last year will increase the strain on the existing manpower and equipment pools.

Costs and leadtimes required for significant expansion of equipment and manpower pools are not considered in the DES. The probable unavailability of offshore rigs, however, is cited (Vol 2, page 412) as a negative consideration in relation to development of a federal exploratory drilling program.

Further sales in the Gulf of Mexico, and any sales in the Atlantic frontier can be expected to further stress existing equipment and manpower pools.

Similar observations may be made relative to availability of spill containment and clean up facilities and personnel. At present, the entire eastern Gulf of Mexico must rely on an equipment concentration at Grande Isle, Louisianna, to deal with any spills of hydrocarbons.

3. Governmental Preparedness:

Activities and workloads reasonably expected to result from the proposed action will make stringent demands on several levels of Government.

The DES does consider to some extent the Federal structures involved in various phases and at differing levels in controlling or managing the proposed activity. Some specific federal action possibilities considered, such as a federal exploratory drilling operation, specifically cite Federal inability as a negative consideration. The overall ability of any Federal entity to respond to the proposed action in any efficient manner is not clearly demonstrated, however.

Coastal state competencies to deal with expected impacts of the proposed action are still largely embryonic. As cited (Vol. 2, page 231), the Resource Planning Associates summary impact conclusions include the statement that "Since the planning effort must come in advance of the new governmental revenues that OCS development could bring, federal or state planning support will likely be required." Florida is more advanced than many other coastal states in this necessary planning process, but is not yet reasonably prepared to deal with the potential or expected impacts of any major discovery off her shores. The DES assumption that Florida production would likely be piped to existing central gulf area facilities may be valid for any panhandle production. It is much less tenable, however, in the event of any significant peninsular shelf production

4. Need for the Proposed Action:

The DES fails to clearly demonstrate that expanded OCS leasing is the only, or even the most efficient way, in which to reduce the supply - demand discrepancy in petroproducts. The document duely notes (Vol. 2, page 386) that "Energy conservation remains the critical area where an impact can be made on our demand - supply gap in energy resources", and dutifully reports saving in oil that have been realized through implementation of selected conservation methods. The treatment of energy conservation methods is far from comprehensive, however, and is not quantitively evaluated in comparison with the proposed action as a mechanism to achieve energy supply - demand equality.

Similarly, the DES fails to consider the potential demand reduction that could be achieved by joint implementation of harmonious alternatives, either as a summary alternative or in comparison to the proposed action.

Determinations by Ford Foundation Energy Policy Project contrary to the proposed action are inadequately considered and are in noways rebutted. Of particular interest is the study finding that conservation measures alone can postpone by at least a decade any real need to proceed with frontier area OCS leasing and other mega-scale fossil fuel recovery schemes. The report further maintains that this ten year relief by simple conservation will not adversely affect overall economic growth.

5. Environmental Impacts:

The report deals in routine fashion with anticipated environmental impacts as if an individual sale were under consideration. The very real potential for megascale chronic impacts is not adequately considered, however.

In the broadest sense, existing OCS facilities represent localized clusters of point sources surrounded by vastly larger reaches of thus far minimally impacted waters, at least in respect to hydrocarbons. If the anticipated numbers of platforms result from the proposed action, it is conceivable that megascale contamination by chronic leakage from facilities located all along the Atlantic and Gulf coasts could simultaneously contaminate the entire seaboard. An exaggerated phenomenon of the same geographic demensions could likewise result from some sequence of isolated catastrophic events occurring in a reasonably compressed time frame. It is thus possible, and not entirely improbable, that the entire coastal zone could be effectively denied to an entire year class of coastal dependent commercial or sport organisms.

In summary, the proposed action is at best illadvised, as evidenced by the a) undesirable economic collusion likely to be imposed on the industry, b) industry probable inability to respond to the offerings in a timely manner, c) the speculative revenues likely to be lost to the Treasury, d) the unpreparedness the State and Federal government to deal with anticipated impacts of the action, e) the lack of any pressing or justifiable need for the action at this point in time, and f) the multitude of unresolved environmental potentialities.

We also have attached a copy of our earlier remarks concerning this subject, since these remarks expand upon the many unresolved environmental and pollution control issues involved in the lease sale program.

Sincerely,

Hamilton S. Oven, Jr.
Hamilton S. Oven, Jr., P.E.

HSOJr/lbm

STATE OF FLORIDA
DEPARTMENT OF LEGAL AFFAIRS
OFFICE OF THE ATTORNEY GENERAL
THE CAPITOL
TALLAHASSEE, FLORIDA 32304

ROBERT L. SHEVIN
Attorney General

130

March 5, 1975

Director
Bureau of Land Management
Department of the Interior
Washington, D. C. 20240

Re: Draft environmental statement, proposed increase in acreage to be offered for oil and gas leasing on the Outer Continental Shelf

Dear Sir:

Once again the Department of the Interior has prepared a massive draft environmental impact statement concerning offshore oil and gas leasing. Once again, the data needed exceeds the data available. The Bureau of Land Management apparently again insists upon granting leases and allowing drilling without adequate baseline studies. When the Bureau of Land Management was proposing leases off the coast of Florida, the Secretary of the Interior promised the State of Florida that proper baseline studies would be carried out prior to allowing the drilling. Such proper baseline studies were not prepared, and the State of Florida, in effect, waived many legal rights by relying on that promise.

Based upon the time schedules followed by the Bureau of Land Management in the past, it is clear from the new draft impact statement that baseline studies will be of little assistance. The drilling will go ahead while data is being evaluated, and damage done by drilling operations prior to complete analysis of the so-called baseline data. The rationale of the agency, at page 339 of Volume 2 of the draft environmental impact statement is, to say the least, extraordinary.

The implication is that acceleration of the leases should not be delayed for on-going studies, because these studies are "never really completed in the sense that they rarely reach conclusions

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with wide applicability, but simply advance from one stage to another, from one level of analysis to another, thereby contributing to a growing area of knowledge and body of literature pertaining to the numerous complexities of environmental analysis. To delay the sale on the basis of incompleted studies would require an indefinite delay, perhaps of many years' duration." What makes this statement so extraordinary is that the impact of drilling and oil spills is impossible to discern, even with the most expensive and thorough long-term study, without proper baseline data. To continue to take data after leasing and drilling have taken place allows the scientists no background with which to compare the altered ecology.

Assuming a critical need for energy sources which prompts the proposed acceleration in acreage offered for oil and gas leasing on the Outer Continental Shelf, I do not believe that any crisis exists which would require the Department of the Interior to go forward with allowing drilling on the Outer Continental Shelf without adequate baseline data. The granting of leases should be postponed until the baseline data has been acquired.

Respectfully submitted,

Robert L. Shevin
ROBERT L. SHEVIN
Attorney General

RLS/Hg

State of Florida

These agencies of the State of Florida responded to the Department of the Interior request for comments. The Division of State Planning letter indicates that the Department of Natural Resources, the Department of Pollution Control, and the Game and Fresh Water Fish Commission responded. However, we did not receive the Game and Fresh Water Fish Commission comments. Through separate mail delivery, we received the comments of the Department of Legal Affairs, Attorney General's Office. These are addressed separately below.

Disposition

Department of Natural Resources (DNR)

The DNR noted that, although the leasing would be out of its area of jurisdiction, it was concerned about movement of produced oil and gas across areas within its jurisdiction, and that it wished to participate in pipeline corridor planning. We can report that DNR is already involved in such planning as a result of an earlier sale in this area.

Department of Pollution Control

1. Economics

The first three paragraphs of comments under this heading are not considered proper material for analysis in an environmental impact statement, i.e., they appear to have no environmental impacts. The economic impacts mentioned in paragraph four are discussed in Section III.J. of the EIS.

2. Industry Response Capability

In general, this category can be answered by the fact no significant (i.e., producible) hydrocarbons have yet been found in the eastern Gulf of Mexico. Exxon recently announced that it was discarding its drilling plans on the tract that sold for a record $211 million. The equipment and manpower for developing that tract is now available for other sites, decreasing the presumed stress on existing material. Stresses with potential payoffs are a natural part of inducing private industry to invest the capital to explore and develop new acreage. Large scale deployment of clean up equipment should logically await the discovery of producible quantities of oil and gas.

3. Governmental Prepardness

We fail to see how we could demonstrate the ability of a Federal entity to respond to the proposed action. The major controlling agencies, BLM and USGS, are increasing their working staff, both at the Washington and field office levels, in response to the increased workload of recent years' increase in OCS development supervision, and environmental studies programs. Budget requests for FY 76 include monies for even more staff, should accelerated development of the OCS begin.

We also fail to understand what is intended in the last paragraph of this section. Some coastal states do indeed have "embryonic" coastal zone plans, but OCS development has such a sufficiency long lag time that most, if not all, of these plans should be finalized. It is also difficult to imagine that Florida's plans are "not yet reasonably prepared" to deal with a major discovery off its shores, since a lease sale was held there in December, 1973.

4. Need for the Proposed Action

The discussion on conservation (Section VIII, Alternatives) has been significantly expanded, and includes discussion of Project Independence and the Ford Foundation Report. Combinations of alternative energy sources are discussed generically. The costs of conserving on a scale necessary to achieve a decade postponement in OCS acceleration are also discussed.

5. Environmental Impacts

We must submit that the possibility raised of denying an entire coastal zone of a year class of coast-dependent commercial or sport organisms is not only entirely improbable, it is extremely remotely improbable. Raising specters such as this is not appropriate to a reasoned environmental analysis. Large numbers of platforms and many pipelines may eventually be constructed, but the intensity of development in any area would hardly exceed offshore Louisiana, and probably fall short. Such catastrophes are not considered very likely in Louisiana. However, chronic low-level pollution is discussed in greater detail, although little of substance can be derived from the literature.

Department of Legal Affairs

The Department of Legal Affairs raises the question of why the Department is proceeding without adequate baseline studies in any or all areas. Perhaps the case was stated incorrectly in the draft EIS, although the argument has some validity. However, more appropriately, baseline studies are not designed to have broad predictive capability. Baseline studies are basically assessments of pre-drilling conditions in an oceanic region. (Oil spill trajectory modelling is the one predictive element that derives from physical oceanographical and meteorological measurements.) Baseline studies may augment known information by their very specificity; certain areas may show indications of geologic instability and thus not be suitable for leasing. Other unique areas may be found. There are adequate mechanisms for making this information known, so that tracts may be withdrawn from leasing, special stipulations may be written on the development of the lease, or notices to operators may be issued requiring certain practices.

Baseline studies imply a natural follow-up effort, i.e. a post drilling monitoring effort, to characterize those changes in the oceanic region that can be attributed to OCS oil and gas operations. This is the basic goal of the environmental studies program. The program should not be viewed as one which is going to give coastal states all the background environmental information and delineate all the impacts that development will cause, so that they make full-knowledge decisions. This is simply not the idea behind the study design.

Executive Department
Atlanta 30334

Jimmy Carter
GOVERNOR

Frank Moore
EXECUTIVE SECRETARY

January 10, 1975

Mr. Curt Berklund
Department of the Interior
Bureau of Land Management
Divisions of Environmental Assessment (730)
Washington, D.C. 20240

RE: Draft Environmental Impact
Statement - Outer Continental
Shelf (OCS); DES 74-90
SCC Number: 74-11-18-08

Dear Mr. Berklund:

This letter is in response to your request for a coordinated State-level review of the draft environmental impact statement referenced above. The Georgia State Clearinghouse sent the statement to those agencies in Georgia which are responsible for the enforcement of environmental standards. As a result of the review process, the Office of Planning and Budget, Executive Department, formulated the following comments:

> On page 65, Vol. 1, discussion of pipeline construction does not seem to indicate whether measures would be used to insure that pipelines are sufficiently buried and armored to prevent problems with anchor dragging or groundings which could break the line, causing spillage of oil. Study done by Georgia indicates that pipelines of this nature should be buried and armored with rock to depths of 60' to avoid anchor dragging problems and disturbance of the pipeline by currents and wave forces.
>
> The text on page 24 states that specific action called for by the National Oceanic & Atmospheric Administration have either been implemented or are being considered by the Department of the Interior. One of these actions, number 3, concerns drill cuttings and muds and how they should be discharged so as to settle outside areas of productive, benthic assemblages: however, on page 79 of the text in the discussion of drilling waste disposal, it is stated that muds and other by-products of the drilling process are routinely discharged without any apparent indication that the recommendation of NOAA has been implemented. Further, on page 86, number 8, Drilling Wastes Disposal, it is stated that no new technology is anticipated in the field of drilling waste disposal and that the only drilling wastes

are drill cuttings and drill mud. The only alternative to discharging these wastes into the sea is to haul them ashore and dispose of them there. However, some consideration should be given at this point, to the possibility of closer determination of where these are discharged into the sea to avoid damage to the bottom communities.

Page 122, Vol. 1, of the document, item E "Proposed Land Use Policy and Planning Assistance" discusses the fact that several, 15 in number, coastal states had already passed some form of coastal management legislation prior to the enactment of the Coastal Zone Management Act. This section also states that many states have applied for funding under the CZM Act for development of program for managing the states coastal zone. At the time this document was printed, information should have been available as to which states had applied and which states were preparing or were in the process of beginning a planning period under the CZM Act. Also, in conjunction with this section, there should be some suggestion or discussion as to the possible requirement that any activity on the outer continental shelf should be coordinated with, and in agreement with, the Coastal Zone Management program of the states which are affected or the states whose outer continental shelf areas are being developed under this program.

Throughout this document, various references are made to appendices and attachments, without numbering or identifying these appendices. Also, it appears that these appendices and attachments are not, indeed, attached, therefore, some action should be necessary to assure that the reader is given an opportunity to review these missing portions of the study prior to any formal action being taken on the recommendations of the study.

Page 146 in the discussion of the types of energy-intensive items used in homes, includes frost-free refrigerators, self-cleaning ovens, color T.V.s, and other electric appliances. It should be noted that while many of these appliances are energy-intensive and energy-inefficient users, some of these, at least one, in the case of frost-free refrigerators, have been indicated to be possibly a saver of energy in recent consumer studies, therefore, a more accurate study of the efficiency of the various appliances should be made available to the consumer so that wise decisions could be made as the energy conscious consumer purchases replacement or new appliances.

The discussion of alternative energy sources, which speaks in the nature of oil shale, is not inclusive in that it does not discuss the problems known to exist in the development of oil shale as a petroleum source. This discussion should include the problems relative to increased salinity in the water rivers which is caused by high use of the water in the processing which results in increased salinity concentrations, or in the vastly increased cost to agricultural operations for being forced to replace present sources of irrigation water with other, more expensive, alternative sources.

Page 567, discussion of maritime forests on a barrier island, lists the species primarily found there. The slash pine, which is related as being pinus carribea, is an incorrect scientific name. The genus is correct, however, the true name is elliottii, therefore, the name being Pinus elliottii.

Discussion of barrier beaches relates attempts by man to stabilize the fording system through the use of snow fences and artificial plantings of dune grass. This is an over-simplification of the problem. Generally, when man moves in with efforts to stabilize dunes, it is because some other force, probably a development or leveling or a disturbance of some sort of the dunes had caused severe erosion and loss of the dune system. Use of snow fences and artificial plantings of dune grass is primarily a measure to try to prevent continued loss and is not a measure which causes the beginning of erosion of the dune system.

Comment on page 571, the discussion of salt marshes and their importance in breeding and nursery grounds, is a very definite over-simplification of the situation. It has been estimated that 85 to 90% of the North Atlantic catch is dependent on the salt marsh systems of the Carolinian and Georgia areas for its nursery and breeding areas. Further discussion of this important factor is very necessary to insure that adequate coverage is given the subject. Indeed, estimates by Eugene Odum, the University of Georgia, and Howard Odum of Florida, indicate that possibly the per acre value of the salt marsh in the Georgia embayment may be above $80,000 per acre.

The discussion of the coastal counties of Georgia began with sector 7 on page 625, and runs through sector 8 on page 628. There should be a number of additional areas listed. These include the Wassau Island National Wildlife Refuge, just south of Little Tybee Island, Skidaway Institute of Oceanography on Skidaway Island, Ossabaw and Saint Catherine's Island, which are held in their natural state, Sapelo Island, with the State Wildlife Management Area and the R. J. Reynolds Wildlife Sanctuary, the Sapelo Lighthouse National Wildlife Refuge and the Georgia Institute on Sapelo Island. There is also, just south of Sapelo, the Wilf Island National Wildlife Refuge. Although Jekyll Island is mentioned, it is not noted as being a State Park, which it is. Cumberland Island, which is mentioned as being proposed for a National Seashore should be clarified. This island was designated by the Congress as a National Seashore and is being acquired presently by the National Park Service, are development plans for the preparation of the island as a national seashore. Also, Cumberland and Sapelo are sildlife sanctuaries in the areas where they are not included in refuges. The Okeefenokee National Wildlife Refuge, in addition to being a refuge, has been recently designed by Congress for inclusion as a unit of the wilderness system. Due to the possibility that Sapelo Island may become a designated estuarine sanctuary under the federal CZM Act, and that other areas along Georgia's coast, which include the Cumberland Island National Seashore and several other pristine research areas and wildlife management areas would indicate a need for extreme caution in the development of the outer continental shelf oil in the southeast Georgian bank.

Table 37, on page 636, Types of Recreation Shoreline by State and Miles, shows Georgia as having 385 total shore miles, 293 march shore miles, and 92 miles of beach. Public recreational shores, shown as being 5 miles. There are presently 14 miles of public beach, which is accessed by road. There are several beaches, including those on Ossabaw Island, and in the future, Cumberland Island, which will be available to the public, or are presently available during daylight hours by boat. These should possibly be mentioned in some manner, so that 5 miles is not incorrectly stated. Georgia's beaches are a valuable resource to the recreation industry of the coastal area and cannot be over emphasized.

Table 41, on page 648, Listing of Georgia Public Recreation Facilities and their Sizes, does not include Sapelo Island and its wildlife sanctuary and national wildlife refuge, R. J. Reynolds Wildlife Sanctuary, Sapelo Lighthouse Wildlife Refuge, nor does it include Jekyll Island as a State Park, or Cumberland Island as a national seashore. Wassau Island National Wildlife Refuge, and the Skidaway Island Institute of Oceanography are omitted from this Table, as well.

Page 661, discussion of harbors, major ports and shipping, Savannah Harbor is very lightly brushed over and does not mention its harbor entrance of 40' channel with a 38' draft, up 23 miles inland to the State of Georgia Ports Authority. The Brunswick discussion, however, is a little more inclusive discussion. The discussion of Brunswick, however, does not include the fact that further expansion of the harbor is unlikely, due to the problem with limestone occuring at depths slightly shallower than 35', which would require blasting or extensive amounts of very expensive dredging.

The discussion of existing environmental quality problems in the coastal zone, beginning on page 691, does not mention a problem which has grown to significant magnitude in the coast of Georgia in recent years, that of water supply for coastal cities and towns, or for improved or expansion of inductrial development. Several cities, primarily Savannah and Brunswick, on Georgia's coast have experienced recent difficulties in obtaining pure water supplies due to salt water intrusion into the sub-surface aquifers. Due to the nature of the coastal plain, much of the water supply used in that area is drawn from sub-surface aquifers, which have their recharge zones near the Piedmont, in the upper State areas. Extremely high withdrawal rates from these aquifers has caused a vacuum which is allowing salt water intrusion into the area and severe problems with cones of depression. Future development in the coastal area of Georgia, at least, will require research into the impact which withdrawal of water supplies sufficient to supply the needs of new development will have on the aquifer.

On page 212, Impact on Recreational, Historic and Archaeological, Asthetic and Conservation Resources, Beach and Shoreline Recreation, the discussion of construction of pipelines across the beach states that first high-tide following burial of the pipeline will serve to restore the beach terrain. Testoration of the beach ridge would take longer. Most likely, requiring a storm tide or high winds to obliterate the effects of excavation. This does not seem to point out the possibility of a blowout, or wash-over occuring at the point where the primary seaward dunes are broken. Research has shown that generally when the dune is broken, either high winds or a storm tide can cause a blowout with substantial amounts of sand being lost from the dune system.

Page 213, Continuation of Discussion of Beach and Shoreline Recreation, seems to indicate that if a beach is oiled (covered with oil), the removal of the sand and the replacement of that sand is a possible or primary alternative for oil cleanup. It does not, however, mention the highly expensive and complicated process required to remove that sand and replace it with sand which can be assured to remain on the site, due to problems of wind and water erosion inherent in the beach-building and maturation process.

Page 214, Discussion of Aesthetic and Scenic Values, seems to indicate that while long-term effect on beaches and dunes caused by pipeline construction may be serious, it is not generally, within the federal government's authority to require the revegetation of affected dunes, unless they are on federal lands. Discussion goes on to say that State or local authorities may require revegetation of dunes disrupted by pipeline installations. We disagree with this. We feel that the federal government, through its licensing and permitting, as well as its sales process for outer continental shelf development, should require the revegetation be undertaken by the constructing company as a condition of the lease.

On page 293, the discussion of Transportation of Oil and Gas Through Pipelines, states that if it is determined that a pipeline right-of-way would have a major impact on the marine or coastal environment, that an environmental impact statement would be prepared. Some statement should also be made as to who would have access to the decision-making process to determine whether, indeed, an environmental impact statement will be prepared. States which would be impacted, as well as local environmental ecologically interested groups should have an input into this process, or should have at the very least a review of the assessment which is made to determine the need for an envoronmental impact statement.

The discussion on page 295 of the Bureau of Land Management's Study to Investigate Extent and Character of Damage to Coastal Resources from Pipeline Construction, is interesting. The State of Georgia looks forward to the opportunity to review this document because of the potentially sensitive subject.

Page 314, Interference with Recreational Activities discussion, in the last paragraph, mentions areas of California, Texas, Florida, New Jersey, Long Island and the New England coast as highly valued and highly used recreation areas. This omits the highly important areas of Tybee Island, as well as Saint Simons and Jekyll Islands, and the newly designated National Seashore on Cumberland Island, all off of Georgia's coast. The recreation industry on Georgia's coast is a multi-million dollar activity, generating many, many millions of dollars into the State's economy on an annual basis. Therefore, mention of this area as a significant recreation resource, is vital to the proper recognition of it as such.

The discussion on page 333, concerning alternatives to the proposed actions and going forward from there into the document, lists several alternatives to the proposed action of OCS leasing. However, all of the alternatives are written in such a way as to cast aspersions on the alternatives in favor of the primary alternative. We do not consider this to be a suitable discussion of alternatives, and feel that actual efforts should be made to determine whether, indeed, any of the listed alternatives would be more attractive and more in the national interest than the one proposed. As a matter of fact, the alternative of No OCS Leasing, which would require alternative sources of energy to be used, would probably be the most attractive in that it would put sufficient pressure in the development of alternative sources, so as to possibly move the U.S. ahead in efforts towards getting away from dependence on hydro-carbon related fuels, as well as conservation of the existing energy resources.

In addition to the above comments on specific portions of the study, the following comments should be noted:

1. A recently published cost/benefit analysis performed by the State of Texas indicates a net cost to states from OCS development. While we in Georgia are, indeed, interested in the future economic development of our coastal area, we are concerned that federal programs do not always provide the predicted economic boom. For this reason, we insist that in addition to environmental analysis an in-depth economic analysis be completed prior to implementation of increases in OCS leases.

The Executive Department asks that all the comments prepared for this statement be thoroughly addressed in the final environmental statement prepared for this project.

We request that the Federal agency forward to us eight copies of the final environmental impact statement that is submitted to the Council on Environmental Quality, and, in the letter of transmittal, please refer to the State Clearinghouse Control number assigned to this statement.

Thank you for your cooperation in this matter.

Sincerely,

Charles H Badger

Charles H. Badger, Administrator
Georgia State Clearinghouse

CHB/sgc

Enclosures: Department of Natural Resources Position Statement dated December 4, 1974

Joe D. Tanner
COMMISSIONER

Department of Natural Resources

270 WASHINGTON ST., S.W.
ATLANTA, GEORGIA 30334
(404) 656-3500

DEC 4 1974

Mr. Chuck Badger
Administrator, State Clearinghouse
Office of Planning and Budget
270 Washington St., S. W.
Atlanta, Georgia 30334

Dear Chuck:

Attached is the Department of Natural Resources position statement prepared in response to State Clearinghouse # 74-11-18-08. This statement reflects the comments and suggestions of all appropriate divisions within the Department. It is my understanding that these concerns will be incorporated in the final State of Georgia position on this project.

Please feel free to contact the Coordinator of the Comprehensive Review System with any questions you may have.

Thank you for the opportunity to comment on this project.

Sincerely,

Joe Tanner

Joe D. Tanner
Commissioner

JDT:bc

Attachment

Department of Natural Resources

OFFICE OF PLANNING AND RESEARCH
270 WASHINGTON ST., S.W.
ATLANTA, GEORGIA 30334
(404) 656-5180

Joe D. Tanner
COMMISSIONER

Charles M. Parrish, III
DIVISION DIRECTOR

December 4, 1974

DEC [illegible] 1974

MEMORANDUM

TO: Chuck Badger, Administrator
State Clearinghouse

FROM: Ray Siewert, Coordinator
Comprehensive Review

ISSUE: Completion of Department of Natural Resources Review of
State Clearinghouse Control Number 74-11-18-08

APPLICANT: U. S. Department of the Interior

PROJECT: Proposed Increase in Acreage, Oil and Gas

Comments

In general the report is timely and well written, and contains a great deal of pertinent information. It also describes in detail a wide variety of general environmental effects. However, it does not recognize the importance of special studies for a particular geographic areas or the value of cooperative efforts with adjoining States for reducing detrimental environmental effects. (Also see attached release of the Committee on Commerce National Ocean Policy.)

Of major concern is the inadequacy of maps and data needed to make appropriate decisions. The time to initiate this mapping and data gathering is now, or it will not be available when we need it.

States are currently funded by the Department of Commerce to plan and develop Coastal Zone Management programs for their coastal areas. This program provides an excellent channel of communication with States. All leasing activities proposals and activities should be carefully coordinated with these programs.

Additional pages attached

DEC 4 1974

Examples of specific areas requiring extensive coordination with the States involved follow.

Reference is made to: Volume I, Page 115 a (top)

"The EPA is also required by Section 403 of the Federal Water Pollution Control Act (FWPAC) Amendments of 1972 to establish standards under which a permit for discharge of pollutants into navigable waters of the U.S. may be issued." (NPDES PERMIT)

The Environmental Protection Agency, Region IV transferred the authority to issue NPDES Permits to the State of Georgia Environmental Protection Division (EPD) on June 28, 1974. Although the authority to issue discharge permits to offshore drilling concerns will probably remain with EPA due to the OCS Lands Act, the Georgia EPD must have a definite role in the formulation of permit conditions.

Reference is made to: Volume II, Page 255

This section describes the effects of a pipeline crossing on coastal beaches, as well as the effects of oil spills on beaches. With detailed environmental studies and consultation with the adjoining State, the necessity of crossing a beach could be avoided, and the probability of experiencing an oil spill reduced.

General Comment without Specific Reference

It is the concern of the Office of the State Archaeologist and Historic Preservation Section of the Department of Natural Resources that the Draft Environmental Statement for the Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf is inadequate in its comments concerning historical and/or archaeological sites. This comment is directed at establishing minimal limits for determining the impact of this leasing on cultural resources located on the Outer Continental Shelf, and areas where pipelines, refineries and storage tank farms are to be built. In keeping with these facts, our comments are based on general concerns and can be applied to any site specific location along the Georgia Coast. It is to be emphasized that the National Register of Historic Places does not contain a listing of all those districts, buildings, or sites of prehistoric and historic significance in Georgia. The absence of such listed places is more of a reflection of a lack of nominations to the Register than actual absence of significantly historic and prehistoric sites.

DEC 4 1974

The following comments are site specific for archaeologic and historic concerns:

I. Drill Sites

The drill sites should be selected in such a manner that no historical sturctures or object, such as shipwrecks, will be distrubed or destroyed without weighing the significance of the sites against the significance of the project. This determination should be supervised and monitered by an archaeologist with the necessary qualifications to conduct and evaluate underwater archaeological surveys. A professional investigation of the project site should include minimally a fluxgage magnetometer-raytheon fathometer study, and EG & G dual channel side scan sonar survey, and direct ocean floor sampling. The use of these survey techniques should include an on-site inspection by an underwater archaeologist where the instrumentation and an archaeological supervisor require it.

II. Pipelines

A. 50+ feet of water:

These areas should be handled in the same manner as the drill sites.

B. -50 feet of water:

There is concern that, in these areas, prehistoric sites, objects, and structures associated with aboriginal human occupations may be encountered as well as those historical sites referred to above. Such areas should also receive a thorough survey of the type requested for the drill sites, and underwater inspection is essential.

C. On land:

These areas require a survey of the cultural resources because there is a high probability that archaeological and historical sites do exist within the project limits.

III. Storage Tank Farm and Refinery Areas

Most of the known archaeological and historical sites are along coastal water courses. They are particularly found at points where fresh water streams meet the sea. Other areas are little understood because most cultural research has been conducted in coastal locations. It is certain that as research continues further inland many previously

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undescribed sites will be encountered. It is our concern for these unreported sites that is emphasized here.

Archaeological and historical surveys need to be conducted prior to any construction. These surveys should contain archaeological and historical reconnaissance, archaeological testing, and historical documentation.

Once the project locations have been surveyed by experienced professional archaeologists and historians the survey should be reviewed to determine the effect of the project on the cultural resources located by the surveys. If there is to be an effect on these resources, the project agency should be prepared to meet the federal requirements necessary to mitigate such impact where it occurs.

These comments are based on the following laws: The Antiquities Act of 1906, the National Historic Preservation Act of 1966, the National Environmental Policy Act of 1969 and Executive Order 11593. Funding in order to provide the evaluation and mitigation concerns expressed in these comments is authorized by Public Law 93-291.

Attachment

cc: Bill Riall
Joe Murray
Lewis Larson
Don Klima
Lillian Dean

FOR IMMEDIATE RELEASE
NOVEMBER 25, 1974

93-333
SECOND SESSION

FROM THE COMMITTEE ON COMMERCE

NATIONAL OCEAN POLICY

DEC 4 1974

WASHINGTON -- Senator Warren G. Magnuson (D-Wash.), Chairman of the Committee on Commerce, today released a staff report of the National Ocean Policy Study on "Outer Continental Shelf Oil and Gas Development and the Coastal Zone". This is the third and final report in a series dealing with offshore oil operations and their coastal impacts. An analysis of North Sea oil development was released earlier this month,and a second report on planned new leasing near southern California was released last Friday.

The National Ocean Policy Study is a Senate initiative under the Commerce Committee which is authorized to undertake a comprehensive analysis of national ocean policy and Federal ocean programs. Created in February 1974 by Senate passage of S. Res. 222, the Study is chaired by Senator Ernest F. Hollings (D-S.C.) and has a membership drawn from eight of the Senate's standing committees.

The comprehensive report released today is based on extensive hearings and literature review of the controversies surrounding development of outer continental shelf oil and gas, and the impact of related facilities in the coastal zone. The report summarizes and analyzes the testimony received during NOPS hearings and makes recommendations pertaining to the Administration's plan to lease up to 10 million acres of OCS lands in 1975, including as much as seven million acres in the Atlantic and the Gulf of Alaska. The report recommends a more moderate 1975 leasing goal, with offerings in new areas deferred until several improvements are made in current offshore leasing and management practices.

A key finding of the report is that coastal states stand to undergo substantial environmental, social and economic changes as a result of offshore oil and gas development. The report concludes that the development of coastal zone plans under the Coastal Zone Management Act of 1972 offers the best means of planning for and minimizing such changes. In addition, once state plans are completed and approved by the Secretary of Commerce, Federal programs affecting the coastal zone -- including offshore leasing programs -- will be required by law to adapt their onshore impacts to conform with the state plans. All 30 coastal states are currently developing such plans, but none is expected to reach completion and approval before 1976.

The report is critical of several aspects of current leasing policies within the Department of the Interior. The lack of good geophysical information -- acquired independently of industry -- is a major factor in placing the Federal government at a disadvantage in trying to assess the value of offshore resources and ensure receipt of a fair market value for

OVER

DEC 4 1974

their sale to the oil industry. The report also recommends government entry into oil exploration operations for the purpose of improving the public data base.

Other shortcomings in current Federal leasing programs include a lack of diligence in enforcing environmental and safety practices, and a failure to tie future leasing plans to the realities of the industry's inability to find sufficient drilling rigs, equipment, manpower and capital to explore and develop oil and gas resources in a reasonable and timely manner.

For further information, contact John Hussey at (202) 224-9345. Copies of the report may be obtained by sending a self-addressed mailing label to the Chief Clerk, Committee on Commerce, 5202 Dirksen Senate Office Building, Washington, D.C. 20510.

# # # # # # #

State of Georgia

The Office of Planning and Budget, Executive Department, submitted detailed comments on the draft EIS which were a compilation of the comments it received in its State-level review process. Many of the comments are more detailed than the scope of this EIS would permit; they will be included in any site-specific EIS prepared for that region. The comments of the Department of Natural Resources are attached, but will not be specifically addressed, as they have been incorporated into the Office of Planning and Budget comments. Suggested changes which have been accepted by Interior are noted by the word "Editorial."

Disposition

Volume 1

Page 65 - We have no indication that pipeline burial should be be required to 60 feet, and would appreciate a copy of the study performed by the State of Georgia. Since pipeline burial requirements were instituted by the Department and Corps of Engineers, major spills from anchor draggings and storm disturbances have been minimal.

The recommendations of NOAA have been implemented to the extent that disposal of cuttings and muds has been expressly stipulated against in areas of unique benthic assemblages. These include the Flower Garden reefs and the Florida Middle Ground in the Gulf of Mexico. Unique benthic assemblages have not been identified elsewhere.

Page 122 - Coordination with States under their own coastal zone plans or the Federal Coastal Zone Management Act is discussed in Section I. Postponement of accelerated OCS leasing pending completion of CZM planning is discussed as an alternative in Section VIII. Attachments should be complete in this document.

Page 146 - Additional detail on appliance utilization seems somewhat out of scale with the scope of this EIS. Energy alternatives have been discussed in a more meaningful manner in Section VIII.

Page 567 - Editorial.

Page 571 - The value of salt marshes as nursery and breeding areas is repeatedly emphasized in the final EIS; other salt marshes besides Georgia's are included in these comments.

Page 625-628 - Several of these areas have been included; however, full listing is more appropriate to a site-specific EIS.

Pages 636, 648, and 661 - Either editorial changes have been made or the information was considered too detailed for a necessarily broad overview of the region.

Page 691 - The water supply problem only seems to present a major problem when refineries are considered. The State retains control over such energy facility siting, and awareness of the problem is the first step toward rational planning.

Volume 2

Page 212 - Restoration will not occur following the first high-tide, as indicated. Possibilities of blowouts (of dunes) has been added to the discussion of impacts on beaches.

Page 213 - Editorial.

Page 214 - This suggestion could only apply to pipeline crossing of Federal lands. Otherwise, it is up to the State to regulate, mitigate, or ban such activity.

Page 293 - Environmental assessment reports on proposed pipelines and other elements of development plans are available from the preparing agencies, which are usually BLM, USGS, and the Fish and Wildlife Service. In Louisiana and Texas, State participation in the assessments has been solicited.

Page 314 - Editorial.

Page 333 - The "no OCS leasing alternative" forms the basis for the discussion of forced conservation and the development of alternate energy sources in Section VIII of the final EIS.

The cited analysis on the costs and benefits to the State of Texas, as well as a similar one for the State of Louisiana, is discussed in Section III of this EIS.

Copies of the final EIS (8) will be sent as requested.

MARYLAND
DEPARTMENT OF STATE PLANNING
301 WEST PRESTON STREET
BALTIMORE, MARYLAND 21201
TELEPHONE: 301-383-2451

MARVIN MANDEL
GOVERNOR

VLADIMIR A. WAHBE
SECRETARY OF STATE PLANNING
MADELINE SCHUSTER
DEPUTY SECRETARY

February 14, 1975

U. S. Department of the Interior
Bureau of Land Management
Division of Minerals Environmental
  Assessment
Washington, D. C. 20240

Attention: Mr. Donald Truesdell

SUBJECT: PROJECT NOTIFICATION AND REVIEW

Applicant: U. S. Department of the Interior

Project: Draft EIS - Oil and Gas Leasing - Outer Continental Shelf

State Clearinghouse Control Number: 75-11-274

State Clearinghouse Contact: Warren D. Hodges (383-2467)

Dear Mr. Truesdell:

The State Clearinghouse has reviewed the above Draft Environmental Impact Statement. In accordance with the procedures established by the Office of Management and Budget Circular A-95, the State Clearinghouse received comments (copies attached) from the following:

Department of Economic and Community Development: advised that the EIS has adequately addressed the physical, ecological and sociological effects. The department has requested the opportunity to review site-specific reports on environmental impact, when they are available.

Department of Natural Resources: has advised that the Draft Environmental Impact Statement (DEIS) is a broad general treatment covering the entire spectrum of the Outer Continental Shelf from Alaska to Maine. As a result, it includes insufficient data from which to base a judgement on the effects of the proposed action on specific environmental, sociological and economic matters of serious concern to the State. Included among the items addressed in the comments which are of serious concern to the State of Maryland are:

- It is considered that the DEIS does not prove that the proposed leasing of 10,000,000 acres on the Outer Continental Shelf (OCS) is a viable action.

- The present mechanisms for leasing may not be the best procedures for optimizing environmental control, resource development and return on investment.

- It is doubtful that leasing the amount of land proposed will allow time for proper environmental assessments.

- The DEIS makes only passing mention of the fact that suggestions have been made to separate exploration and development. The State of Maryland has consistently recommended a re-examination of the present system of leasing which combines exploration development and production.

- The statement on page 285, Vol. II, that "Baseline studies must precede leasing for validity", is concurred in, but it is doubted that this can be adequately accomplished under the proposed accelerated program. The fact that this was not done in the Gulf of Mexico, prior to drilling, although understandable, it should point out the necessity for obtaining the information in this case prior to drilling in frontier areas.

- The DEIS does not analyze the effects of instituting a petroleum industry in a frontier area and neglects the following vital areas of concern in frontier areas:

  1. Does accelerated leasing produce net benefits? The quick lease of 10 million acres is proposed for an industry and government geared to a 3 million acre per year leasing level.

  2. How will offshore drilling affect coastal zone land use? Offshore oil production initiates onshore development. The President's Council on Environmental Quality estimated that the Outer Continental Shelf development could initiate industrial growth of all developable land in the Middle Atlantic Region.

  3. What secondary impacts should a frontier area anticipate? A petroleum industry in a frontier region will place secondary support demands on that region such as pollution containment, additional refineries, and increased population with its socio-economic effects.

Our staff review resulted in the following comments:

- This Draft Environmental Impact Statement (DEIS) includes a detailed description of offshore hydrocarbon exploration and exploitation. However, it is felt that the document falls short of its purpose to analyze the various potential environmental impacts resulting from the proposed action. The statement fails to fully analyze those impacts it acknowledges and fails to recognize other impacts entirely.

- Many pages are devoted to impact analysis, but no attempt is made to attach costs or other relative measures to those impacts.

- The DEIS states that the proposed action will cause an unspecified disruption of benthic organisms, but does not say what the effect will be on the environment as a whole. It states oil lost in a spill or blow-out can be removed, but gives no indication of the magnitude of costs for removal. It is realized that the subject of oil spills and blow-outs involve many intangibles and call for assignment of probabilities and costs to events which have rarely, if ever, occurred. However, such events should not be minimized by stating that they are not likely to happen. One spill or blow-out could destroy a delicate ecosystem. The fact that this can occur, despite all precautions, should be apparent, and the results of such an occurrence discussed.

- Nearly 75 percent of this DEIS is devoted to the description of the action and existing conditions while less than 12 percent deals directly with environmental impacts that may result from this action. While a page count is not the best basis for criticism, it is believed that more effort should have been devoted to treatment of the environmental impacts.

- The DEIS states how much land will be required by onshore support facilities and the value of construction, but it does not give any indication of the costs and benefits to the effected community. Chart 82 which contains virtually all of the information produced from the land-use analysis states that by the year 2,000, the South Atlantic OCS region, which includes Maryland, can expect a demand of up to 75,400 acres for onshore facilities: more than 115 square miles. Obviously, the conversion of this much land to oil production will have a drastic impact on a great many communities. These impacts are not discussed in the DEIS.

- The DEIS envisions 272,000 people being drawn to the South Atlantic region by the year 2,000. Schools, sewerage, roads, recreational facilities, housing, as well as social services, must be provided and they must be paid for. This environmental statement makes no attempt to estimate the costs of these items or to indicate a source of funds for them. In addition, depending upon the amount of oil and gas found and the Federal policy concerning the intensity of production, exploration and production could vary from a few years to a great number of years. The Statement should include a discussion of the impact of "boon towns" to "ghost towns" in the event the decision is made to expend the available resources in a limited number of years.

- The combined effects of land use and socio-economic impacts upon areas which will bear the brunt of onshore activities from offshore hydrocarbon development will be profound. It does not appear that these impacts have received adequate treatment.

As a result of this review, it is requested that serious consideration be given to the comments included in the review in the preparation of the next draft of this Environmental Impact Statement.

Sincerely,

Vladimir Wahbe
Vladimir Wahbe

Encl
cc: Paul McKee
Jerold Gettleman

sw

Maryland Department of State Planning
State Office Building
301 West Preston Street
Baltimore, Maryland 21201

Date: 2/10/75

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT REVIEW

Applicant: U. S. Dept. of the Interior

Project: Draft EIS - Oil and Gas Leasing - Outer Continental Shelf

State Clearinghouse Control Number: 75-11-274

We have reviewed the above draft environmental impact statement and our comments as to the adequacy of treatment of physical, ecological, and sociological effects of concern are shown below:

	Check (X) for each item	
	None	Comment enclosed
1. Additional specific effects which should be assessed:	X	
2. Additional alternatives which should be considered:	X	
3. Better or more appropriate measures and standards which should be used to evaluate environmental effects:	X	
4. Additional control measures which should be applied to reduce adverse environmental effects or to avoid or minimize the irreversible or irretrievable commitment of resources:	X	
5. Our assessment of how serious the environmental damage from this project might be, using the best alternative and control measures:		X
6. We identify issues which require further discussion of resolution as shown:		X

Signature Jerold Gettleman for

Title Director

Agency Community Development Admin.

February 11, 1975

MEMORANDUM

TO: Mr. Warren Hodges, Chief
State Clearinghouse

FROM: Director
Community Development Administration

Jerold Kettleman for

RE: Draft EIS- Oil and Gas Leasing- Outer Continental Shelf
Clearinghouse Number: 75-11-274

The Draft Environmental Statement on the outer continental shelf drilling for oil and gas is admittedly a preliminary study. First, it presents a very broad overview of the geo-physical picture of the coastal regions involved. Second, it describes in sufficient detail the technology of off-shore exploration and production of oil. Finally, it brings to fore environmental and socio-economic issues that are expected to arise. Thus, it is a very useful background document, with no pretensions of being a final verdict on the feasibility of off-shore drilling at a specific site. The definitive judgement on a given site is appropriately deferred until the preparation of the site-specific studies.

As sites concerning Maryland interests are identified for off-shore drilling, we would be extremely interested in reviewing the relevant site-specific reports on environmental impact, when they become available.

Maryland Department of State Planning
State Office Building
301 West Preston Street
Baltimore, Maryland 21201

Date: 11/15/74

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT REVIEW

Applicant: U. S. Dept. of the Interior

Project: Draft EIS - Oil and Gas Leasing - Outer Continental Shelf

State Clearinghouse Control Number: 75-11-274

We have reviewed the above draft environmental impact statement and our comments as to the adequacy of treatment of physical, ecological, and sociological effects of concern are shown below:

	Check (X) for each item	
	None	Comment enclosed
1. Additional specific effects which should be assessed:		✓
2. Additional alternatives which should be considered:		✓
3. Better or more appropriate measures and standards which should be used to evaluate environmental effects:		✓
4. Additional control measures which should be applied to reduce adverse environmental effects or to avoid or minimize the irreversible or irretrievable commitment of resources:		✓
5. Our assessment of how serious the environmental damage from this project might be, using the best alternative and control measures:		✓
6. We identify issues which require further discussion of resolution as shown:		✓

Signature Kenneth N. Weaver
Title Director
Agency Maryland Geological Survey
DNR

Paul W. McKee
Assistant Secretary, Resourc

DEPARTMENT OF NATURAL RESOURCES

POSITION PAPER

DRAFT ENVIRONMENTAL STATEMENT

PROPOSED INCREASE IN ACREAGE TO BE OFFERED FOR OIL AND GAS LEASING ON THE OUTER CONTINENTAL SHELF

DES 74-90

This OCS draft EIS differs from earlier impact statement because it addresses a specific policy (the extent and location of possible leasing rather than a specific proposal (a lease sale in a given area). For this reason the EIS is of necessity a broad general treatment which covers the entire spectrum of the Outer Continental Shelf from Alaska to Maine. Because it is such a broad brush treatment, the States are given too little data on which to base a judgment as to the effects of this action on their specific environmental, socialogical and economic concerns. Moreover, we do not believe the report proves the proposition that the leasing of 10,000,000 acres on the OCS is a viable action. We also believe that the present mechanisms for leasing are not necessarily the best procudures for optimizing environmental control, resource development and return on investment. We are also concerned that the proposed increase in acreage leased will not allow sufficient time for environmental assessment, the establishment of environmental baseline data, and monitoring systems. This information will be critical in judging the efficacy of leasing any one area on the OCS, and, furthermore, will be necessary in measuring environmental changes should leasing and development proceed.

The following section will assess in greater detail the general remarks made in the preceeding section:

The State of Maryland has consistently called for a reexamination of the present system of leasing which presently combines exploration, development and production (see State of Maryland statement in C.E.Q. Study). The C.E.Q. study did not address itself to this question because the staff felt it was outside the charge for their investigation. The present Draft EIS makes only passing mention of the fact that suggestions have been made to separate exploration and development (granting of exploratory oil and gas leases, see p. 410-411, Vol. II). We feel the general methodology outlined on p. 411 has merit and should be closely examined. While there may be many valid reasons for not going to such a system, the Draft EIS does not address the various pros and cons of such a methodology. We feel that there should be an in-depth discussion of this proposal. Certainly the present discussion in the Draft EIS is insufficient to convince us that the present system of leasing is the one that will optimize return to the government, environmental assessment, and the expeditious development of needed resources.

The section on Environmental Impacts of the Proposed Action is replete with conditional phrases such as, "we believe," "cannot be conclusively demonstrated," "it is not likely that," "we presume that," "we estimate that" etc. This is perhaps a reflection of the fact that it is very difficult to establish unequivocal cause-effect relationships in the complex ecosystem with which we are dealing. It also seems to me to point to the great gaps in environmental information which should be in hand to make a critical evaluation of impact. By examining the historical record, it seems relatively clear that had we obtained sufficient environmental baseline data on the Gulf of Mexico 20 years ago, and, furthermore, had followed with a well-designed monitoring program, we would be in a much better position today to draw conclusions concerning the effects of drilling in the Gulf. It is understandable that this was not done 20 years ago, but it should certainly point to the necessity of collecting this type of information prior to drilling in frontier areas. Given the scenario of leasing 10 million acres in 1975, it would seem a herculean, if not impossible, task to develop this baseline data in any more than a perfunctory manner. Even if the proposed acreage to be leased were halved, one would not have adequate lead time to design, plan and implement a comprehensive program of environmental assessment prior to drilling. On page 157 of Vol. II, the statement is made: "Rarely has an area been well enough characterized environmentally that changes caused by a massive oil spill or chronic pollution, can be identified." It seems to be this statement alone is an indictment of the past and suggests a guideline for the future-[illegible] developing comprehensive environmental baseline data.

On page 285, Vol. 11, the statement is made: "Baseline studies must precede leasing for validity." We would certainly agree wholeheartedly, but we question whether this can be adequately accomplished under the accelerated proposed program.

Where environmental assessment, baseline studies and monitoring are discussed in this report, the emphasis is on the OCS. But the impacts of greater concern to the States are those on its immediate offshore area, its coastlines, the wetlands and inland areas. It seems to be the intimation of the report that this is a function of the States and local governments. The necessity for environmental baseline studies is no less important for the coastal zone than it is for the OCS areas. Furthermore, these assessments will be very costly and will strain the budgets of most States. If the increment in oil supply to be derived from the OCS is so important to the U. S. energy and economic pos ture, then it would seem only equitable for the federal government to give the States financial assistance to carry out the necessary environmental assessment, baseline and monitoring programs.

In a recent publication (U.S. Geological Circular 702) entitled "Movement and Effects of Spilled Oil over the Continental Shelf-Inadequacy of Existent Data for the Baltimore Canyon Trough Area," the authors conclude that the movement and dispersal of spilled oil cannot be adequately defined with existent data. Moreover, they make specific reference to the "tremendous amounts of time, money and effort that are required for the collection and synthesis" of this type of baseline data (p. 14). They conclude: "These inadequacies are not likely to be either quickly or easily rectified. Direct current measurements in the Baltimore Canyon Trough area, for example, should be made, at the very least for a full year and during times of inclement weather conditions when chances of obtaining reliable data are uncertain. Lead times to obtain necessary data for decisions on petroleum exploration and production on the Outer Continental Shelf should be anticipated" (underlining for emphasis).

This report from a Department of the Interior agency lends support to the points we discussed previously on envionmental assessment, baseline studies and monitoring.

Early in the study it is admitted: "Much of the information used for elucidating impacts is derived from the Gulf of Mexico experience which, while it offers many insights and some conclusions regarding impacts, does not always lend itself to the unique characteristics of other regions" (Vol. I, p. 16, underlined for emphasis).

Unfortunately, this study never heeds its own advice. The study never analyzes the effects of instituting a primary petroleum industry in a frontier area; instead it lingers on a review of the quasi-understood impacts of oil operations on physical and biological environments. The end product of this approach is to apply lessons taught in a long-term production area to virgin territory without further analysis. This neglects at least three vital areas of concern in frontier areas:

a) Does accelerated leasing produce net benefits? Oil industry and government personnel and capital reserves are geared to the three million acre/year leasing level. Although personnel and capital reserves may be increased, the increase must occur over time. Haste undercuts planning and training. A quick leasing of 10 million acres, as proposed, constitutes a dumping of oil lands on the market. This dumping will, almost surely, drive prices (and government revenue) down. It will also stretch manpower reserves. The ratio of skilled oil field operators to acre of exploration-leased land will diminish. Accident risks attendant with primary production may rise accordingly.

b) How will offshore drilling affect coastal zone land use? Offshore oil production spawns pressures for onshore development. The President's Council on Environmental Quality has estimated that the Outer Continental Shelf development could initiate industrial growth on 21% of all developable land in the Middle Atlantic Region. This study notes that "A city where rapid growth has already occurred and planning agencies exist, like Jacksonville, should be more able to respond to Outer Continental Shelf related growth than the samller communities that are not experienced in meeting the demands of growth" (Vol. 2, p. 246), but no attempt is made to detail the type and level of land use planning that is deemed adequate to mitigate adverse impacts from the Outer Continental Shelf development. If the sense of this study is that environmental impacts are reduced when land use planning proceeds concomitant with Outer Continental Shelf development, then this important conclusion should be spelled out, and fought for as a qualification on all leases issued.

c) What secondary programmatic impacts should a frontier area anticipate? Introduction of a primary petroleum production industry into a frontier region will place secondary support demands on that region. The Bureau of Land Management study neglects secondary areas of impact, such as:

1. Pollution containment. Existing Outer Continental Shelf production

areas have ongoing emergency pollution control procedures, including warehouses full of oil spill control equipment and materials. Government must mandate industry to supply the same level of protection from oil spill damage in frontier areas as is offered in production regions. The study does not address this point at all.

2. Onshore economic impacts. In Vol. 2, p. 322 it is stated that new refineries onshore as a result of Outer Continental Shelf development are a "slight possibility." Outer Continental Shelf oil, it is believed, will substitute for expensive foreign crude. Reliable energy assessments, on the other hand, suggest that Outer Continental Shelf oil will not substitute for expensive foreign oil, but will complement it in fueling America's continuing oil demand. Fourteen proposals for new East Coast refineries are at various stages of development ("Coastal Zone Management," August 28, 1974).

We suggest that the following areas need greater emphasis in the EIS:

(1) An effort should be made to reduce or eliminate the following sources of contamination during drilling operations:

a. Discharge of drilling muds which can suffocate benthic organisms, and often contain hazardous chemicals, such as, ferrochrome lignosulfonate;

b. Discharge of formation waters having high salinities and low concentrations of dissolved oxygen;

c. Discharge of drill cuttings and water contaminated with oil;

d. Blowouts, which are especially dangerous when the workover of one well takes place while adjacent wells are allowed to produce;

e. Flaring of gas.

(2) While present regulations require pipelines to be buried under three feet of sediment in waters less than 200 feet deep, and under ten feet of sediment in channels, it is possible for pipelines to sink or float after burial. It should be demanded that pipelines be properly weighted - the technology is available - to insure

their stability within the sediments.

(3) It was found during the Torrey Canyon oil spill that the detergent used to disperse the oil slick resulted in greater environmental harm than the oil. Other countries have recently developed less toxic dispersants. The U. S. should provide greater financial support for research involving the dispersal and biodegradation of spilled oil.

(4) Increased emphasis should be placed on research concerning the effects and fate of dissolved aromatic hydrocarbons, since it is known that many polynuclear aromatic hydrocarbons are carcinogenic.

(5) Emphasis should be placed on spreading the locations of production platforms, and insuring the prevention of debris being lost overboard, in order to reduce the impact on the offshore fishing industry.

STATE OF MARYLAND
MARYLAND GEOLOGICAL SURVEY
LATROBE HALL, THE JOHNS HOPKINS UNIVERSITY
BALTIMORE, MARYLAND 21218
TELEPHONE: 235-0771
235-1792

TO: Paul McKee

DATE: December 30, 1974

FROM: K. N. Weaver

SUBJECT: Draft EIS - O.C.S. Oil and Gas Development SCH# 75-11-274

You will recall that the DNR position paper on the above subject was put together within a rather tight time-framework. Consequently, our draft was approved before the Fisheries Administration's comments were received. Nick Carter has obviously spent a good deal of effort in reviewing some of the ramifications of the EIS having to do with fisheries and I believe his statement should be included as an addendum to our position paper if this is still possible. A copy of his comments is attached.

KNW/mel

Attachment

12/31/74

To: Warren Hodges

Paul W. McKee
Paul W. McKee, Assistant Secretary
Department of Natural Resources

INW

REC
NOV 26 1974
MARYLAND
GEOLOGICAL SURVEY

MARYLAND DEPARTMENT OF NATURAL RESOURCES
FISHERIES ADMINISTRATION

NATURAL RESOURCES BUILDING
ANNAPOLIS 21401
AREA 301 267-5558

TO Dr. K. N. Weaver, Md. Geological Survey DATE November 25, 1974

FROM W. R. Carter, III, Fisheries Administration

SUBJECT: Clearinghouse Project 75-11-274: U.S.D.I. Draft Environmental Statement - Proposed increase in acreage to be offered for oil and gas leasing on the outer continental shelf. Fisheries Administration Comments.

The primary deficiency of this draft environmental impact statement (DEIS) lies in its presentation of the anticipated impacts on the nearshore and coastal zone environments (Volume II, Sections III C, III D, III E, pages 190-274. Also deficient, as a result of the above, are the assessments of Unavoidable adverse environmental effects (Sections V. A, V. B, V. D, V. E.)

The reason for the failure of adequate assessment is that the DEIS limits its consideration almost entirely to the aspect of a catastrophic spill situation/event. It almost totally ignores the local environmental effects of refinery operations and the ancillary effects of population growth associated with large industrial complexes.

Assessment of the refinery complex-associated degradation/effects is limited to pp. 219-250 (Volume II) which deal with socio-economic effects. Table 82 (p 228) gives the results of a model study dealing with refinery siting in the Middle Atlantic region. The table indicates that for a situation of 68 offshore platforms (or refinery capacity to serve a similar volume) the locality affected would, by 1985 and 2000, respectively, have the following impacts:

	1985	2000
population increase (1000's)	59.6	66.0
acreage required (for refinery?) (1000's)	32.4	35.5
Number of refinery equivalents (200,000 bbl/da)	1.9	2.8

Page 227-229 merely points out that regional planning will be necessary to site the facilities in such a way that pollution is minimized.

Page 304 (Section V) indicates that from 4000 producing wells in the Gulf of Mexico, about 75 barrels of formation water (briny) per well/day are discharged at the shore facility. Mosely and Copeland (1974) cite Teller (1961) to the effect that the ratio of brine to oil is about 50-100 to 1, which indicates that a very large quantity of brine could be generated at a shoreside facility handling 380,000 - 560,000 barrels of oil daily. This could, of course, be notably diluted, if mixed with other refinery effluents; Bond and Straub (1974) indicate that water useage at the typical refinery runs about 785 gallons per barrel, however, the dilution water is not other wise pure.

Mosely and Copeland report that few organisms are capable of adapting to brine dominated systems. Diversity indices of both phyto and zooplankton are depressed in brine dominated systems. This is apparently in response not only to high salinities, but to the fact that the ratios of salts are very different from those found in seawater. Osmotic balances are affected. Where salinities ranged around 50-60 ppt in a brine receiving system, the number of species of fishes caught was depressed from 2 to 4.

With certain algal species able to adapt to brine conditions, diurnal oxygen cycles were grossly exaggerated, causing severe stresses to community metabolism (Odum et al, 1963, in: Mosely and Copeland, 1974).

No mention of the stressing of the receiving system by brine wastes was made in the DEIS.

In addition to overlooking the stresses imposed upon receiving systems by brines, the DEIS does not mention the toxicity of petroleum wastes from refineries. Copeland and Steed (1974) indicate that the wastes from refining are not only toxic to most organisms but also are not easily broken down. They predict that the coastal systems of the United States will be more stressed in the future than they have been, as a result of OCS operations. Such effects will involve many animals and plants being killed, or in the case of motile animals, being driven out (Copeland and Steed, 1974).

With regard to the latter effect, i.e., being driven out, the DEIS makes several mentions of motile species being denied the use of an area (Vol. I, p. 577, vol. II, p. 173, p. 175) but implies that this is preferable to being killed outright. This point of view suggests an ignorance of the workings of the concept of "carrying capacity." Generally speaking, a habitat supports all of the individuals of a given species that it can, because the rate of reproduction is almost invariably capable of producing more organisms than can be accomodated. Therefore, when habitat is lost, or made uninhabitable for a sufficient time, the number of the organisms which depended on that habitat are killed. They do not have the option of moving to another similar habitat, because habitat is, in general, already completely occupied. More specifically, it is usually those organisms which were displaced which die, because of the additional stress placed on them by displacement. This fact places them at a competitive disadvantage vis-a-vis others of the same species.

As expressions of the results of additional stresses associated with refinery wastes, Copeland and Steed (1974) report that species diversity for phytoplankton, zooplankton, benthic communities and fish were all depressed in various studies of the waste-receiving areas.

One study cited by Copeland and Steed particularly referred to the effects of BOD loading as well as the toxicities of refinery waste. Table 82 of the DEIS mentions the percentage increase in BOD for 1985 and 2000, respectively, as being 29-68% and 30-104%. Should such changes be imposed in estuarine subsystems already having poor circulation, the effects upon the biota could be extremely severe. The DEIS does not mention this possibility.

In addition to failing to mention the brine and refinery waste stressing imposed upon receiving systems affected by development associated with OCS oil production, the DEIS does not mention the stresses associated with local population increases. Locally, human populations might be expected to increase by 9 59 to 66 thousand (in model study). This growth will necessitate additional sewage treatment plant capacity to cover a population approximately the size of that in Wheaton, Maryland (1970 census). Baltimore County is currently planning the expansion of sewage treatment to cover 66,500 persons in the Middle River area. The anticipated flow addition to Back River sewage treatment plant is 24.34 MGD. The residual BOD and biocide discharge associated with such an effluent could severely aggravate stresses on the biota of the receiving aquatic habitat.

Similarly, the additional stresses to the receiving system which derive from sedimentation are not discussed in the DEIS, although Table 82 makes a projecti on 32-35,000 acres additionally needed in the locality where refineries are sited. It is not clear whether this projected figure deals with refinery requirements only, or whether it is supposed to cover the area required for population shifts of the magnitude projected. If the former, then the sedimentation stresses anticipateable would be manified many times.

The DEIS does not purport to substitute for site specific DEIS's required for individual areas. Therefore it cannot postulate effects for specific areas. Effects of channel dredging and spoil disposal would be notable different between different areas, however, to the extent that coastally located terminals and refineries will engage in waterborne transport, there may well be some modifications required to area channels. It should be expected, and even an overall DEIS should mention that such possibilities exist and that there would be implications for the aquatic habitat associated with them.

The DEIS does not attempt to mention the ramifications of the sum of such considerations or the implications for sport and commercial fisheries. It does indicate that in the Gulf of Mexico, no ill effects have been felt from the OCS petroleum itself, but the potential effects of habitat conversion onshore, land use and its runoffs, and the integrative effects within the biotia communities have not been adequately addressed.

Literature Cited

Mosely, F. N. and B. J. Copeland. 1974. Brine pollution system; in: Coastal Ecological Systems of the United States, ed. H. T. Odum, B. J. Copeland, & E. A. McMahan. Conservation Foundation.

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Odum, H. T., W. Siler, R. J. Beyers, & N. Armstrong, 1963. Experiments with engineers of marine ecosystems. Univ. Texas Inst. Mar. Sci. Publ. 9:373-403.

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State of Maryland

The draft EIS was reviewed by the Department of State Planning, the Department of Economic and Community Development, the Department of Natural Resources, and the Maryland Geological Survey. Each of these agencies' comments are addressed in turn in the dispositions that follow.

Disposition

Department of State Planning - This department summarized the comments of the departments of Economic and Community Development, and Natural Resources. Each of these departments' comments are addressed below from the original material.

Department of Economic and Community Development - This department advised that the EIS adequately addressed the physical, ecological, and sociological effects of the proposal. It requested that it review any site-specific reports when available. The BLM hopes that the State Clearinghouse will include this department for such review.

Department of Natural Resources - Page 1 - The final EIS addresses accelerated OCS development from the standpoint of conducting six lease sales per year through 1978, including proposed sales in any or all frontier areas. Specific acreage targets have been eliminated from the proposal. Moreover, environmental baseline work in the Middle Atlantic area will commence very soon (probably September); monitoring programs will be established at a later date, after assessment of baseline conditions and drilling success (or failure).

Page 2, para. 2 - The final EIS discusses the separation of exploration and development in greater detail (see Section VIII on Alternatives).

Page 2, last para. to page 3 - The need for environmental baseline data has been recognized by the Department, which is making a major effort at establishing pre-drilling conditions in all frontier areas. Those aspects of the environment which most appropriately lend themselves to measurement and analysis will be identified and investigated to establish current conditions which may change as a result of operations.

Page 3, para. 2 - More appropriately, baseline studies must precede development for validity.

Page 3, para. 3 - The Department recognizes that nearshore and onshore impacts are of great importance for complete assessment of impacts. To some degree, it is the function of State and local governemnts to plan for these possibilities, or to decide not to accept them, e.g., through Coastal Zone Management planning. Environmental studies nearshore either are or will be a part of the total program. Several socio-economic studies have already begun, as has nearshore environmental work in the Gulf of Alaska. The U.S. Fish and Wildlife Service will be conducting a wildlife survey in the coastal regions of South Texas. Other studies are in planning.

Page 4, para. 1 - The Department has proceeded as quickly as was fiscally and temporally possible to begin baseline work in the Middle Atlantic area. All major negotiations have been completed and field sampling should begin in September, 1975. The Geological Survey is participating in the field sampling and analysis efforts.

Page 4, para. 4 - The EIS takes cognizance of the fact that there are many unknowns in OCS development. Potential impacts are discussed in broad scope and utilize available knowledge as it applies to large scale effects. The impacts in virgin areas is more difficult to assess.

a) The proposed acceleration will occur over time, although some strain is always attendant to such acceleration. The proposal has been modified to a six sale per year concept, with no attendant acreages. The revenues should not be diminished as independent evaluations are performed on resource value; bids must attain minimum acceptable levels or acreage is not leased.

b) Many of the specific land use conflicts and pressures can not be detailed in one environmental statement. This is the primary reason that site-specific statements will be prepared for each individual sale proposal. In this way, specific potential impacts can be identified for each area in light of its unique conditions.

c) Secondary impacts are discussed in a generic manner in the final EIS.

1) Pollution containment equipment is required under the existing operating orders, and will be continued in frontier areas.

2) The final EIS takes the stance, verified by current developments in refinery construction, that the add-on from OCS development is extremely difficult to assess. The push for new refineries is not caused by increased OCS production.

(1) The Depaatment feels that adequate controls are in force to minimize the impacts of these effluents, or strong justification is needed for making the mitigation more stringent.

(2) Requirements for pipeline burial and weighting are currently being

investigated by BLM, USGS, and Office of Pipeline Safety.

(3) The use of dispersing agents has been expressly banned by EPA except in emergencies involving potential loss of life.

(4) Toxicity research either currently being conducted by EPA or in planning as a special study by BLM will investigate this point.

(5) Production platforms tend to be located where the oil is. Loss of debris is forbidden, but may happen accidentally. When wells are abandoned, the site must be dragged to remove such hazards.

Maryland Geological Survey - This group submitted the comments of the Fisheries Administration, which are discussed below.

Page 1, para. 2 - The final EIS expands its scope of inquiry to consider in greater detail impacts other than the catastrophic oil spill. Much of the succeeding discussion on refinery impacts are not addressed in the final EIS because the increase of OCS induced refinery growth can not be spearated with any degree of precision from the base case of refinery growth that would ensue without increased OCS development. In any case, refinery effluents can be regulated by State and local agencies to nearly any desired level of effluent.

Page 1, last para. and page 2, para. 1 - These statemnts merely reiterate statements made in the draft EIS.

Page 2, para. 2 to page 3, para. 3 - Formation water discharges, both at sea and at shoreside facilities (individual separators or refineries) are cumulatively called chronic discharges of oil in the final EIS. These discharges have been identified as introducing probably as much or more oil to marine or esturaine environments as the total of major oil spills. The effects of such continual low level discharges are generally recognized as unknown but potentially serious. Much of the separation of oil and water is conducted on the platform, as it is more economical to transport as much oil as possible through pipelines, plus it reduces the corrosion that sea water (actually brine water) causes on the inside of the pipe. Much of this formation water is re-injected into wells to enhance the flow of oil and maintain structural pressures.

While biological systems are undoubtedly stressed by the introduction of high salinity, low oxygen water, it is felt that this stress is minimal in the open ocean where rapid dilution reduces the differences between the ambient water and the introduced water. In coastal waters and estuarine waters, the effects could and would be more pronounced, but the additional effects from refinery effluents that would be produced from accelerated OCS development can not be separated from that which would occur from normal increased refinery capacity that is apparently happening without OCS development.

Likewise, the normal wastes from refineries that are toxic will produce deleterious effects on aquatic organisms, but how much of this will be caused, if any, by increasing our domestic production?

The detailed secondary impacts of OCS development can not conceivably be completely covered in one EIS, i.e., one that could be handled. The kinds of impacts that might result from OCS development, not necessarily their locations or magnitudes, are addressed as generic impacts. Since most of the coastal regions of the U.S. are quite different in their present industrial (or lack of) development, each must be addressed individually regarding the potential impacts that OCS development might have on them. This is the function of the site-specific impact statement; such a statement will be prepared for each and every lease sale the Department proposes to hold on the OCS. Onshore secondary impacts will be felt most dramatically in sparsely populated, non-industrialized areas. In highly developed areas such as the Middle Atlantic, much of the impact will be absorbed without too much adjustment, considering that the refining complex of the upper Delaware River will be supplied by domestic production instead of imports. The possibility of inland siting of refineries is mentioned in the EIS; many of the possible coastal water quality impacts would be mitigated by such an action. The impacts may just be transferred however, if adequate measures are not adopted to prevent discharge of toxic effluents into rivers and streams. Such mitigation can be accomplished by the use of holding tanks and purification systems that must reduce toxic discharges to levels that do not disrupt ecological balances.

The final EIS describes the current port handling capacity of the various OCS regions; channel dredging for pipeline access is discussed also, with its concomitant impacts on biota caused by increased turbidity, resuspension of toxic substances, and removal of habitat.

The cumulative impacts of accelerated OCS development on the sport and commercial fishing interests of the U.S. are difficult to assess. A brief section on the theoretical problems of such an analysis is included in the final EIS.

The Commonwealth of Massachusetts
Executive Office for Administration and Finance
Office of State Planning and Management

THOMAS O'BRIEN
DIRECTOR

Leverett Saltonstall Building, Room 909
100 Cambridge Street, Boston 02202

AREA CODE 617
727-5066

February 28, 1975

Mr. Curt Berkland, Director
U.S. Department of the Interior
Bureau of Land Management
Division of Minerals Environmental Assessment (730)
Washington, D.C. 20240

RE: A-95 Review of Draft EIS, Outer Continental Shelf Oil and Gas Development
State Clearinghouse Identifier 74110756

Dear Mr. Berkland:

The Massachusetts State Clearinghouse, in accordance with the provisions of OMB Circular A-95 and the National Environmental Policy Act, has reviewed the Draft Environmental Impact Statement to accelerate Outer Continental Shelf (OCS) oil and gas leasing to ten million acres in 1975.

Comments were requested from the Executive Office of Environmental Affairs, the Massachusetts Energy Policy Office, the Coastal Zone Management Program of the Executive Office of Environmental Affairs, the Departments of Natural Resources and Public Health, the Merrimack Valley Planning Commission, the Metropolitan Area Planning Council, the Southeastern Regional Planning and Economic Development Commission, the Cape Cod Planning and Economic Development Commission, and the Martha's Vineyard Commission.

Attached you will find copies of the testimony of the Executive Office of Environmental Affairs and the Coastal Zone Management Office delivered at the Trenton, New Jersey hearing on the Draft EIS. Both statements indicate that this EIS does not adequately address the potential environmental issues. The Department of Natural Resources in its attached comments expresses similar concerns and further states that the availability of data and technology also appears to be inadequate.

Taking these comments into consideration, the State Clearinghouse concludes that this Draft EIS does not adequately assess the environmental impact of the planned action as required under the National Environmental Policy Act.

Sincerely,

Adriana Gianturco

Adriana Gianturco
Acting Director of State Planning

cc: Arthur Brownell, DNR; Charles Terrell, CZM; Gene Socolich, MEO

The Commonwealth of Massachusetts
Executive Office for Administration and Finance
Office of Planning and Program Coordination
Leverett Saltonstall Building, Room 909
100 Cambridge Street, Boston 02202

~~ROBERT H. MARDEN~~
DIRECTOR
Thomas O'Brien

AREA CODE
727-415

REQUEST FOR REVIEW OF PROJECT NOTIFICATION
MASSACHUSETTS STATE CLEARINGHOUSE (727-4154)

TO: Commissioner Arthur Brownell
Department of Natural Resources

DATE: November 13, 1974

REPLY DUE: December 4, 1974

APPLICANT: U.S. Department of the Interior

TYPE OF PROJECT: Draft EIS on the proposal to accelerate Outer Continental Shelf (OCS) oil and gas leasing to ten million acres

CLEARINGHOUSE IDENTIFIER: 74110756

NOTE: Please return application to Clearinghouse

The Massachusetts State Clearinghouse has received notification of the proposed project described on the attached and is referring it to your agency for comment. It is requested that you review this proposal focusing on its compatibility with your agency's plans, programs and objectives. Please complete the form below, using additional sheets if necessary, and return it by the due date noted above.

Explanatory Comments

The DNR does not consider that this Draft EIS adequately deals with the many issues involved in, or that may result from, the proposed action - particularly as the various impacts may effect the Commonwealth. Furthermore the question of jurisdiction over these waters by federal or State is still unresolved at this time. In general, the leasing plan and its draft EIS are considered premature. Adjacent states have not developed their CZM plans so as to effectively respond to operations proposed on the O.C.S by others, much less the on-shore by-product of this activity.

The availability of data and technology as described in the EIS appear inadequate to insure sufficient protection against oil spills, provide quick and effective cleanup, or to determine what significant effects on our marine resources may result from the various operations developing from these leases. Attached are specific comments made by appropriate Divisions in the Department of Natural Resources.

A W Brownell
(Signature)

2/27/75
(Date)

The Commonwealth of Massachusetts
Department of Natural Resources
Division of Marine Fisheries
Leverett Saltonstall Building, Government Center
100 Cambridge Street, Boston 02202

February 3, 1975

MEMORANDUM TO: Frank Grice, Director

FROM: W. Leigh Bridges, Assistant Director

SUBJECT: Draft Environmental Impact Statement, 74-90, on the Proposed Increase in Acreage for Oil and Gas Leasing on the Outer Continental Shelf, Prepared by the Bureau of Land Management, U. S. Department of Interior

The above-titled document describes in a general way the environmental impact on the proposed leasing of 10 million acres of outer continental shelf lands for oil and gas leasing. The scope of this leasing includes areas on the Atlantic Coast, Gulf Coast and Pacific Coast, and attempts to summarize the impacts on the resources in these areas. More definitive impact statements will be produced on the effects of exploration, development, and transportation of oil and gas as these areas are leased and developed. The following is a list of specific comments:

1. Volume 1, Page 98, Section h, discusses contingency plans and equipment for controlling and removing pollution. It is noted that standby pollution control equipment will be immediately available at a land-based location. The use of pollution control equipment for effective control of offshore oil spills is questioned. Since this equipment will be land-based and will be located as much as 20 to 100 miles from

the nearest platform, it is difficult to envision effective deployment of equipment in a timely manner to prevent the spread of spills in offshore areas.

2. Pages 100 through 102, Section b, on-site inspection: this section does not contain enough information to give the reader an overall idea of the effectiveness of the inspection program. The frequency of inspection is questioned, since it would appear that producing wells are only inspected once a year. Similarly, the content of these inspections is not clearly defined.

3. On Page 106, the value of fines for failure to install subsurface safety devices in 1970 in the Gulf of Mexico is presented. It would be more appropriate to present several years' data on the number of fines, warnings and suspensions so that the reader could gain some insight as to whether the inspection and enforcement program is effectively reducing the numbers of spills and other operational failures.

4. On Page 115a, it is noted that the Corps of Engineers requires that pipelines crossing shipping fairways be buried to a depth of 10 feet. In order to reasonably protect fishing operations in areas where pipelines may conflict with trawling, it is suggested that the States and the National Marine Fisheries Service require a similar pipeline burial policy.

5. On Page 117 (c), the report indicates that NOAA is conducting environmental baseline studies sponsored by the BLM in the Gulf of Alaska. Because of the expertise of the NMFS in the North Atlantic area, and in particular the Georges Bank area, with respect to stock assessment programs, it is suggested that the BLM contract environmental assessment studies to the NMFS for the North Atlantic area. Background information, already available, in the NMFS will be valuable for any rational assessment of the environmental impact oil development in this area. It is also suggested that the several States' fishery agencies be represented in determining and reviewing the content of these studies. Such a program has already been suggested by the State fishery directors and that these studies should be begun immediately.

6. On Page 126, it is noted that each coastal State is required to have membership on the OCS Research Management Fishery Board. It would appear that Massachusetts would have a considerable stake in representation on this board when studies begin in the North Atlantic area. It is noted that fisheries interest should be required of the State Representative.

7. On Pages 129 and 130, the report summarizes present studies being conducted by the BLM in the Atlantic area. No mention is made on whether or not future stock assessment and ichthyoplankton studies will be conducted. Such studies are of paramount importance to a realistic impact assessment on the fisheries, particularly for the Georges Bank area which has in the past produced approximately 12% of the world's fish production. It would appear that to date the BLM has bypassed to a large extent, the Federal agency ([illegible]) which has the most expertise for conducting these kinds of assessments.

8. On Page 211, it is noted that Boston has a higher frequency of reduced visibility than other areas in the North Atlantic due to fog and haze. The importance of the fact of this reduced visibility would appear to have a large bearing on the operation of oil production facilities in this area. Moreover, weather conditions would have a large impact on the proper spacing of platforms with respect to minimizing interference with fishing operations. It would appear that some information on this subject could be derived from experience in the North Sea.

9. On Page 253, fishery statistics would appear only to reflect domestic landings and values. Foreign fishery harvests must be included [illegible] reflect the true value of the fishery stocks of the Atlantic [illegible].

10. Pages 663 to 675 discuss landings and values of commercial fisheries of the Atlantic Coast States. It is pointed out that, in particular, this presents a biased value of the stocks in the North Atlantic section. In the case of Maine, Massachusetts, and Connecticut, decreases in total pounds landed since the 1960's have been directly related to foreign fishing effort in offshore waters. Foreign harvests from the U. S. Atlantic Continental Shelf should be added to these landings and values reported. While foreign harvests are not reflected in the value of U. S. fisheries [illegible] should be reflected in the value of the fish stocks of the Atlantic Coast.

11. While the statistics reflect a realistic value for extractive [illegible] including fishing, they do not represent a true picture of the commercial stocks off the Atlantic Coast. A large increase in foreign [illegible] has effectively depressed the domestic values of these fisheries. The North Atlantic fleets have been reduced because of competition [illegible] foreign nations. A significant portion of the demand for fish [illegible] the U. S. is supplied through foreign imports. Domestic fishery [illegible] and values could be expected to increase provided some management [illegible] was adopted by the U. S. for these offshore waters.

12. On Page 681, Paragraph 2, the University of Rhode Island report is quoted. It indicates that fishing is projected to decrease in relative and possibly absolute importance. As noted above, domestic fisheries have declined and will continue to do so if management levels are not adopted for offshore loss. The present capacity demand in the U. S. for fish has increased from 11 to approximately 12 pounds per person. In addition, 70% of the demand in the U. S. is currently met by imports. If effective management were adopted, a large portion of this demand could be met from domestic sources.

The following comments pertain to Volume II of the Impact Statement concerning the Environmental Impact of the Action, Mitigating Measures Included in the Action, Unavoidable Adverse Environmental Effects, and Alternatives to the Proposed Action.

1. On Page 157, Section III, the report states the difficulty in quantifying the effects of large oil spills because of the scarcity of existing information on the environmental impact. It is pointed out that with the prior quantitative studies it is almost impossible to pretend this impact. Therefore baseline environmental studies are imperative prior to leasing, exploratory drilling and production in the OCS.

2. On Page 169, Paragraph 2, the BLM concludes that sooner or later a major oil spill will occur wherever there is oil development. The BLM also concludes a rapid recovery of plankton populations affected by major spills. While this may hold true for many invertebrates, it is not the case with egg and larval fish forms and lobster larvae. It is quite possible that a large oil spill could effectively destroy a whole year class of fin fish or lobster in a particular area.

3. On Page 170 it is reported that formation water is treated to remove most of the entrained oil (not greater than 50 ppt average). This statement would appear to conflict with previous statements regarding discharges of formation water where all but 50 ppm is removed. This statement needs some clarification.

4. On Page 172, Paragraph 2, discussion of the impact of oil on meroplankton does not consider the effects on such benthic animals as lobsters which spawn only once every two years. The larval distribution is relatively unknown. However they are believed to concentrate at the surface. Therefore the impact could be considerable on offshore lobster populations. It should be noted on Pages 174 and 175 that during the West Falmouth oil spill in 1969 several hundred thousand fin fish were killed due to the direct toxic effects of No. 2 fuel oil. The kill involved approximately 25 species of fin fish.

5. On Page 185, Paragraph 2, it is noted that special stipulations can be attached to any lease sale to mitigate potential damage to a unique feature. It is questioned whether such mitigation can also be applied to living marine resources of significant commercial value. If this is the case, it should be the responsibility of the BLM to propose an effective system of mitigation in areas where spills will occur.

6. Pages 157 through 187 describe the impact of oil spills and contamination on various components of the biological communities in the offshore areas. Nowhere in this section is there any mention of the effects of oil spills on fish eggs and larvae or lobster larvae. However, great emphasis is placed on the short recovery period for the zooplankton and phytoplankton communities. This error of omission is inexcusable considering the importance of fisheries in the North Atlantic section. One would judge from this treatment that the BLM has written off any concern for fisheries stocks as they may be affected by oil development.

7. On Pages 192 and 193, it is again noted that substantial numbers of fin fish were killed in the West Falmouth oil spill. This was pointed out previously (Item 4) and should be reaffirmed in this section since mortalities involved much more than intertidal and beach fauna as noted.

8. On Page 267, Paragraph 1, it is noted by Hester (1974) that oil spills could possibly destroy a year class of clams or grunion. This citation appears to be one of the few references in the report which would indicate there is any possible effect or potential destruction of fish year classes. Again the report emphasizes the temporary reductions in plankton populations resulting from oil spill.

9. On Page 268, Paragraph 4, it is reported that the impact on bottom-living species such as lobster and shrimp is likely to be very local because of the benthic habits of these animals. However, there is no indication that lobster larvae are associated with a surface film.

10. On Page 270, the report indicates that the relative spacing of oil platforms is important in considering the potential impact on commercial fishing activities. As a point of information, the report should indicate what spacing requirements or regulations have been adopted in the Gulf of Mexico to reduce this potential conflict.

11. On Page 271, Paragraph 1, it is indicated that pipeline corridors and burial out to the 200 foot depth interval reduces the hazard of obstruction conflict with trawling operations. Because trawling is so widespread on the North Atlantic shelf, the BLM should advance definitive proposals for minimizing this potential conflict. It is also noted that the traditional fishing grounds should not be pre-empted for exclusive use by oil developers.

12. Pages 266 through 273 deal with the effects on commercial fisheries. This section does not address the potential losses of ichthyoplankton and the resulting effects on successive year class stocks of fish. Much greater consideration of this impact is necessary in the report.

13. Pages 287 through 303, Section IV, discuss mitigating measures included in the proposed action. This section does not include any discussion or mention of direct monetary assessments against lessees for damage to living marine resources resulting from oil spills or other operating procedures. Some system of resource loss mitigation is needed and should not be omitted from the final statement.

14. On Page 328, Paragraph 2, it is noted that the Council on Environmental Quality ranks Georges Bank as one of the areas with the least environmental risk. It would be helpful to know the basis for this ranking and whether or not the effects of oil development on fishery production were included. More background information is clearly needed in this ranking of areas for environmental risk.

15. On Page 412, the alternatives of a Federal exploratory drilling program and a Federally conducted off structure stratigraphic drilling program are discussed. Both alternatives to the present system are dismissed with the indication that it would not be practical under existing manpower and budget constraints. Since these alternatives will be a significantly large Federal effort, the federal manpower and budget constraints are not a realistic limitation. It is pointed out that no new large Federal program has ever been established without a massive infusion of both money and manpower. The advantages of Federal exploratory drilling programs might outweigh the disadvantages when dealing with private oil developers.

16. Page 421 discusses a division of management and supervisory functions between agencies. Regardless of who has supervisory or management functions in the Federal establishment, the need for self-sufficiency of energy production will far outweigh any and all objections to OCS development whether real or imagined, since the value of living

resources will be of secondary or tertiary concern with any Federal supervisory or management agency. It is hoped, however, that suitable controls on production as well as leased areas can be initiated to provide maximum protection of living resources.

In conclusion, the Draft Environmental Statement does not provide sufficient information to evaluate the effects of OCS development on marine resources. No provisions are made to include values and landings of foreign nations of Atlantic Coast fish stocks occurring in the OCS. With the exception of one reference, there is no discussion, evaluation, or indeed an implication that major oil spills could significantly affect commercial fish stocks through the destruction of ichthyoplankton and lobster larvae. There is no attempt to suggest specific remedial measures to minimize conflicts between fishing and oil development operations, including trawling and platform spacing, as well as pipeline burial in the North Atlantic area. Potential exploration areas for development, as currently known, are not presented in sufficient detail to determine specific areas of possible conflict with fishing operations. With reference to the North Atlantic Coast, the traditional rights of fishermen to these areas may have historical legal implications which were not discussed in the report. Finally, the report emphatically states that oil spills in producing areas are inevitable, but there is no discussion or suggestion that some system of mitigation for damage to living resources should be developed.

The Commonwealth of Massachusetts
Water Resources Commission
Leverett Saltonstall Building, Government Center
100 Cambridge Street, Boston 02202

OFFICE OF THE DIRECTOR
DIVISION OF WATER
POLLUTION CONTROL

MEMORANDUM DECEMBER 6, 1974

TO: Arthur W. Brownell, Chairman, (Attn. Bob Cook)

FROM: Thomas C. McMahon, Director

SUBJECT: DES 74-90 - Vol 1 of 2 - Oil & Gas Leasing on the OCS

The Division of Water Pollution Control has the following commen
the Draft Environmental Statement. Headings refer to those in tl
subject document.

7 I. B. The recommendations of NOAA reported on pp 24-25 in order
preserve fishing resources are endorsed and should be implemented
awarding any leases.

Vol. I

I.C.2 - The Draft EIS acknowledges on p. 86 that "no new technolo
anticipated in the field of oil spill containment and cleanup".
every authority acknowledges the inadequacy of current technolog
deal with oil spills in the open ocean. A commitment to advancin
technology and translating it into commercially available equipme
crucial to acceptance of OCS leasing off the Atlantic Coast.

II.A.1. - Practically no physical data on wave height and energy
reported. Fig. 25 & 26 are based on theoretical calculations and
that Georges Bank has the highest frequency of high seas in the Atla
OCS leasing areas. This will have a significant impact on the enviro
mental and safety hazards during drilling as well as on the design of
platforms to survive through maximum storms (112 ft. waves per page 2
The natural phenomena acknowledged on pp 264-266 must be considered in
detail on any site-specific EIS.

TCM/DLC/cmf
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Oral Testimony on the Draft Environmental Impact Statement Hearings on the Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf by the U. S. Department of Interior

Evelyn F. Murphy, Secretary of the Executive Office of Environmental Affairs
Commonwealth of Massachusetts, at Trenton, New Jersey, February 13, 1975

Good Afternoon. As Cabinet Secretary of the Executive Office of Environmental Affairs of the Commonwealth of Massachusetts, I wish to thank you for the opportunity to present this brief testimony on the issue of a proposed acceleration of offshore leasing. My presentation here will be supplemented by continuing testimony on the more technical aspects of the document, and also by more than fifty pages of written testimony received through the cooperation of various state agencies, academic institutions, and public response.

The purpose and directives of the Environmental Impact Statement are extremely ambiguous.

It is stated in pages 14 to 17 of Volume one, that the document, "addresses a proposed policy program", yet the document only covers issues of scope and location related to accelerating the leasing schedule and not the critical policy issues such as revenue sharing. It also does not examine the alternative OCS policies under NEPA, but just describes modifications together with brief historical data.

It should be noted that an EIS under NEPA is not to be made after a policy decision has already been determined. In this instance it seems that the Department of Interior had decided last November when it released the new leasing schedule. The schedule is only "proposed", granted, but the policy decision to accelerate the leasing was inherently made four months ago. Rather, and I quote from NEPA, section 1500. 2(a) on Policy, "As early as possible and in all cases prior to an agency decision concerning recommendations or favorable reports on proposals...Federal agencies will..,assess in detail the potential environmental impact." This is federal law. We seem to be discussing the environmental impact "after" a policy decision, and this clearly seems contrary to the law.

Finally, on this point, it should be noted that NEPA requires detailed assessment, whereas this document deals in generalizations. The site-specific environmental impact statements for individual lease sales will, of course, contain more detailed impact assessments, but again, only after the policy decision has been made to accelerate leasing.

One further point is that the specific purpose of the environmental review is to accelerate leasing to ten million acres, a figure which the Interior Department now claims is too high.

What is the rationale, then, of conducting a hearing on a specific proposal already obsolete? Or, is the hearing in fact only a strategy to inculcate the states to believe that the federal government is becoming more cooperative by its decreasing that figure to something more palatable after the initial shock of a 10 million acre proposal.

Aside from its puzzling purpose and directives, the document is a compilation of generally available data, some of which has no relevance to offshore oil, combined with little or no analysis. It is too "large" to be considered background information for the layman and too general to cover the problems that might result from offshore development in any specific locality. The document obviously suffers from a poorly defined objective.

The first part of Volume I, on lease management systems and historical offshore production, is redundant, wordy, and lacking in continuity. More importantly, there are several significant omissions. In a brief discussion of the U.S.G.S. extimates of total recoverable OCS reserves, no mention is made of the estimating methodology used nor the fact that these estimates are much higher than the bulk of other industry and geologists' projections, often by a factor of two or more.

One of the better sections of the more recent, site-specific E.I.S.'s prepared by the Bureau of Land Management is a chapter on past spill estimates. That chapter was not included in this document. Except for one sentence on page 338, Volume II, nowhere do we find any presentation or analysis of past spill experience. An offshore oil E.I.S. that does not discuss the likelihood of oil spills fundamentally misses the point.

The remainder of Volume I and the first part of Volume II is devoted to a general description of the regions in which leasing is being considered. Much of the information in this 700 page section appears irrelevant. While the names of major highways and airports are fascinating, such information has little relevance to offshore oil. No analysis of this data is attempted. No advantage is taken of the rather extensive work on sea state, and likely spill trajectories which has been done by both industry and non-industry groups.

The latter part of Volume II, from page 157 on, is the most interesting and important portion of the document. Whatever analysis of the alternatives and impacts has been done, is done here. Unfortunately, that is not very much.

The presentation jumps from scattered facts to overall qualitative conclusions with little or no intervening argument. For example, one statement in Volume II, p. 158 claims, "No geographic area would have 10 million acres offered in 1975, so effects would be generally less than those observed in the Gulf of Mexico, aside from catastrophic spills." No factual basis for this argument is offered. This statement implies that, if all areas respond like the Gulf of Mexico and if production were less, then the expected effects in other areas would be less because they are smaller. Such analysis sheds little insight into the issues at hand.

The section on alternative energy sources is confusing and lacks a clear focus. It is, essentially, general discussion of resources presently available.

Direct relevant comparisons of the alternatives are lacking. For example, an obvious analysis would look at the oil likely to be spilled in offshore production. It is possible to argue from existing oil spill data that the net effect of offshore oil would be to reduce the amount of oil spilled off New England. Throughout the document, the extremely important distinction between gross and net effect is not maintained. In the final analysis, it is the net effect that counts, yet the document concentrates almost entirely on gross impacts.

Perhaps the strongest statements made anywhere in the report appear in the brief section on alternative leasing systems, Volume II, pp. 410-426. The writer's bias is brought out in the first paragraph where larger bonus bids are termed "counterproductive". The key question is: Counterproductive for whom?

The document purports to be a discussion of alternative leasing policies, yet the very important alternative of public exploratory drilling is accorded only two paragraphs in which arguments for and against are either ignored or dismissed without substance.

The report presumes that the government would carry out the drilling itself or would contract offshore rigs. The argument against such a drilling program is that it would divert exploration from industrial firms. It does not take into account that government supported drilling would provide information which would not have to be duplicated by the oil companies at a later date.

If there is a sizable find on the George's Bank, then there is a large differential between the cost of landing the oil and its true market value. This raises the critical questions of how this differential is shared between the federal government, adjoining states and the developer. The document does not address this question and it is this question which is key to the coastal states, and unless it is addressed, you can expect to see resistance, up and down the Atlantic Coast.

There will be benefits from offshore oil development accruing to both the nation and the state. The question is how they are to be divided and who will receive the benefits. On one hand, how much should go to the private industry? How much should government obtain and how much flexibility should the government have in determining the value of our offshore resources and the means to allocate these resources.

How much should the public know regarding the value of the property which supposedly belongs to the public? How should the offshore revenues be divided? These are basic issues and they must be answered.

It seems to me that we need a policy which protects the environment to the degree that is possible without seriously jeopardizing the economic benefits. Moreover, the policy should aim to have the maximum impact upon the social or economic conditions of the contiguous land without again, seriously jeopardizing the benefits.

The E.I.S. report before us today does not address those issues and in not addressing them fails in its true purpose that of forming a foundation for a national decision - whether or not to accelerate the leasing of our offhsore lands.

Oral Testimony on the Draft Environmental Impact Statement Hearings on the Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf by the U.S. Department of Interior.

Matthew B. Connolly, Jr., Director of the Massachusetts Coastal Zone Management Office, at Trenton, New Jersey, February 13, 1975.

Good afternoon. My name is Matthew Connolly and I am Director of the Coastal Zone Management Program of Massachusetts. My intention is to comment on the technical deficiencies in the EIS of the proposed development of oil and gas on New England's Outer Continental Shelf. There are two major areas on which I will speak: the Georges Bank as a commercial fishery and on-shore impacts as they relate to the OCS plans.

One of the most glaring inadequacies is the lack of an in-depth analysis of the Georges Bank commercial fishery. This resource has provided protein not only to the United States, but to the entire world for over 400 years, yet the report fails to sufficiently document the importance of the fishery, either to the United States or the world. The statement shows that these marine resources are threatened by large scale O.C.S. oil and gas development, but no where is the question of whether the Outer Continental Shelf can remain both an energy source and food resource. This is one of the most important questions that must be answered before the O.C.S. is developed, yet no where in the statement are these two questions fully analyzed in the same section. At one point, the E.I.S. states, "Oil spills present the greatest potential hazard to commercial fish and shell-fish. Fish kills have been documented in several areas of major spills of refined oil." Moreover, it states that oil pollution may introduce carcinogenic hydro-carbons into the aquatic environment which may in turn be concentrated within the bodies of commercial fish and shell-fish, so as to become unfit for human consumption. The implications of these impacts are not addressed. In addition to the direct toxic effects of oil spillage on fish, O.C.S. development will remove thousands of acres of the sea bed and water column from commercial fishing by virtue of physical obstruction. The E.I.S. fails to demonstrate the appropriate connections between the fishery and the New England region. There has not been a thorough investigation of the consequences to fishermen of locating oil structures in a place where fishermen have traditionally operated an extensive bottom, drag and trawl fishery. What will be the effects on boat manuverability, accidents, and changes in fishing methods due to underwater obstacles? The biological effects on the fishery are inadequately assessed with no analysis of ichthyoplankton, little analysis of plankton relationships to oil in the aquatic environment, and in inaccurate account of recolonization of flora and fauna if oil should destroy or deplete the biota from an area. No information is provided on the American lobster, its population and annual migrations between in-shore and off-shore of this area. There are no effects given on sea scallops and the impacts to the marketability of fish and shell-fish tainted by oil products. Little explanation is given to effects on fecundity of the plankton and nekton species. The document merely lists a few species but does not discuss the dynamics of food chains in the ecosystem. The evidence presented on O.C.S. development versus food resources is lacking.

In spite of its present depleted stocks of fish, the Georges Bank itself remains as a viable environment for the significant production of fish products into the future. The impact on marine resources is quite important information, for in these days of world food shortages and potential mass starvation, the Outer Continental Shelf can represent a very rich world food resource. This fact should not be underestimated and the long-term benefits ransomed for a possible short-term gain. You can't eat oil.

In relation to the impacts which may occur near the coast and on-shore, the E.I.S. inadequately describes the near-shore environment of beaches, salt marshes, rocky shores, shell-fish flats, and estuarine systems in general. In several cases, there are serious errors about these ecosystems which have been transferred into incorrect conclusions. An example is the supposed erosion of beaches after being re-vegetated by man. There are also sweeping generalizations about the near-shore area, where an example in one part of the country is said to be representative of the entire coastline. In fact there are great differences and comparisons are inappropriate. The description of water quality in Massachusetts is an entirely inaccurate picture and sounds as though Massachusetts Bay were slightly better then an open sewer. No intelligent conclusions could be drawn from this description because none of the dynamics of the various environments are demonstrated. Each component is treated as if it existed as an independent, static entity and had no relation to the other neighboring systems. Development of O.C.S. will have great impacts on water quality. There is an insufficient description of the implications for spilled oil in the aquatic environment. Oil spills have lethal effects on estuaries, bays and wetlands, which in New England are among the most productive in the world. These provide the breeding and growing grounds for many species of marine life. Thus, destruction of wetlands and estuaries by direct or indirect oil spillage or development can have distinct effects and ultimately affect the marine resources that humans rely upon. Oil has been shown to be lethal to the benthic dwellers and these creatures are even more affected by drilling and pipe-laying operations which directly impact their living area and cause them to be smothered by large amounts of sediments. There is no critical analysis which would project the possible implications of O.C.S. development on the planktonic base of the food chains. Also, the degradation rates of spilled oil in the colder climate of New England is open to question because of the reduced numbers and species of bacteria and the lower metabolic rates of the organisms when compared to warmer climates.

Landward impacts are at best only scantily discussed with no long term planning conceived. Much of the data which has been presented is old and more recent data such as the Southeastern New England Study is available. The possibility exists of having 17% of the prime industrial land in Rhode Island and Eastern Massachusetts to be utilized in the full development of O.C.S. oil and gas. A commitment of this amount of land, with its consequent environmental impacts, will have significant ramifications for the area, and should not be undertaken without sufficient study and policy consideration.

The E.I.S. reveals that large amounts of land will be needed for construction of refineries, petro-chemical plants and other petroleum related industries, such as drill-rig and pipe assembly plants, construction materials and services to sustain the O.C.S. production. In fact, the statement does not discuss what would happen if a refinery were to be built in the New England area, and it casually questions the real possibility of a refinery in New England.

If none of the oil will initially be transported into New England, then it is very possible that New England will bear many of the burdens from O.C.S. development yet receive little benefit in terms of increased supply of oil and gas. If this should be the case, then this type of decision making information should be clearly available in the statement. It will be a crucial factor to determine how on-shore development should proceed, at least on the state and regional level. The statement does not show whether the net impact of the needed increase in services, which will be required of municipalities, would outweigh the benefits of increased employment and tax revenues. What will be the shifts in population, the new kinds of jobs and specialties needed, the extra services required to meet changing populations? How will cities be able to respond to the development which may occur? The study states that cumulative impacts of O.C.S. development can be controlled through proper planning and coordination among federal, state and local governments, and private industry, but has this actually occurred? For example, the Coastal Zone Management Act was passed to elucidate and plan for the effects of coastal development, but the Department of Interior has indicated that it will not wait for Coastal Zone Management programs to be developed before O.C.S. leasing progresses. We believe this to be a hypocritical position on behalf of the Federal Government.

The Federal Government has shown little intention of sharing decision-making with the states on the O.C.S. issue. The Federal Government should take positive steps to join with the states and the public at-large in making decisions on the timing and the extent of

O.C.S. oil and gas development. Until that attitude is fostered by the Federal Government, the states should exert every means within their control to enforce their rights to protect its citizens, the environment, and livability of the economy of the state. The ultimate goal is for the states to have an effective voice in policy decisions and subsequent development that emanate from the leasing of the Outer Continental Shelf. The additional stress which the eco-system can absorb is limited, and at present the bounds of the limitation are not known, but shouldn't we want to know the parameters of environmental capability before massive O.C.S. development commences? Because these long term limitations and impacts are not known and are not discussed in the draft environmental statement, the statement should be considered inadequate. It may be wise to postpone O.C.S. development until the outer bounds of such impacts are delineated. Perhaps a better alternative policy than the one the Department of Interior is proposing is to postpone the increase in O.C.S. development. This would allow development of pollution control technology, base-line environmental studies, coastal and land plans, and regulations. This will allow O.C.S. development to proceed with greater benefits and fewer adverse consequences to the people of the affected regions. More importantly however, this country should not develop O.C.S. reserves until it has considered the total consequences in lightof U.S. energy needs, the world food problem and impacts to adjacent areas. Once these long term policy questions are placed in perspective and the short term questions have been settled, then O.C.S. development, if deemed the best policy, could commence.

Report of the Coastal Review Center

on

Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf.

Draft Environmental Impact Statement
U.S. Government # DES 74-90

January 29, 1975

I.- Proposal

On April 18, 1973 former President Nixon requested the Council on Environmental Quality to join with the Environmental Protection Agency, the National Academy of Sciences and other federal agencies to "study the environmental impact of oil and gas production on the Atlantic Outer Continental Shelf and in the Gulf of Alaska". In his Energy Message of January 23, 1974 the President directed the Secretary of the Interior to triple the leasing, from the amount originally planned to 10 million acres in 1975.

It is estimated by the Environmental Impact Statement (E.I.S.) that approximately 20 million acres will have to be offered in order that 10 million acres can actually be released. Since the issuance of the E.I.S., however, Secretary of Interior Rogers C.B. Morton has indicated that less than 10 million acres will be leased. The exact amount has not been disclosed.

The E.I.S. prepared by the Bureau of Land Management is an attempt to assess the environmental impacts that could result from a major, Federal action in new or "frontier" areas of the outer continental shelf (O.C.S.). The directive of the President to lease 10 million acres by 1975 represents a significant change in Federal policy concerning the development of domestic O.C.S. oil and gas reserves; therefore, the E.I.S. was developed to address the environmental impacts of this increase in leasing.

New England is concerned primarily with the portion of the E.I.S. discussing the Georges Bank region. The region lies about 75 miles due east of Cape Cod extending from southwest to northeast for approximately 150 miles. Seaward of the Georges Bank lies the Continental Slope where the ocean bottom drops from a depth of 40 fathoms (240 feet) to 1,000 fathoms (6,000 feet) over a distance of approximately 25 miles.

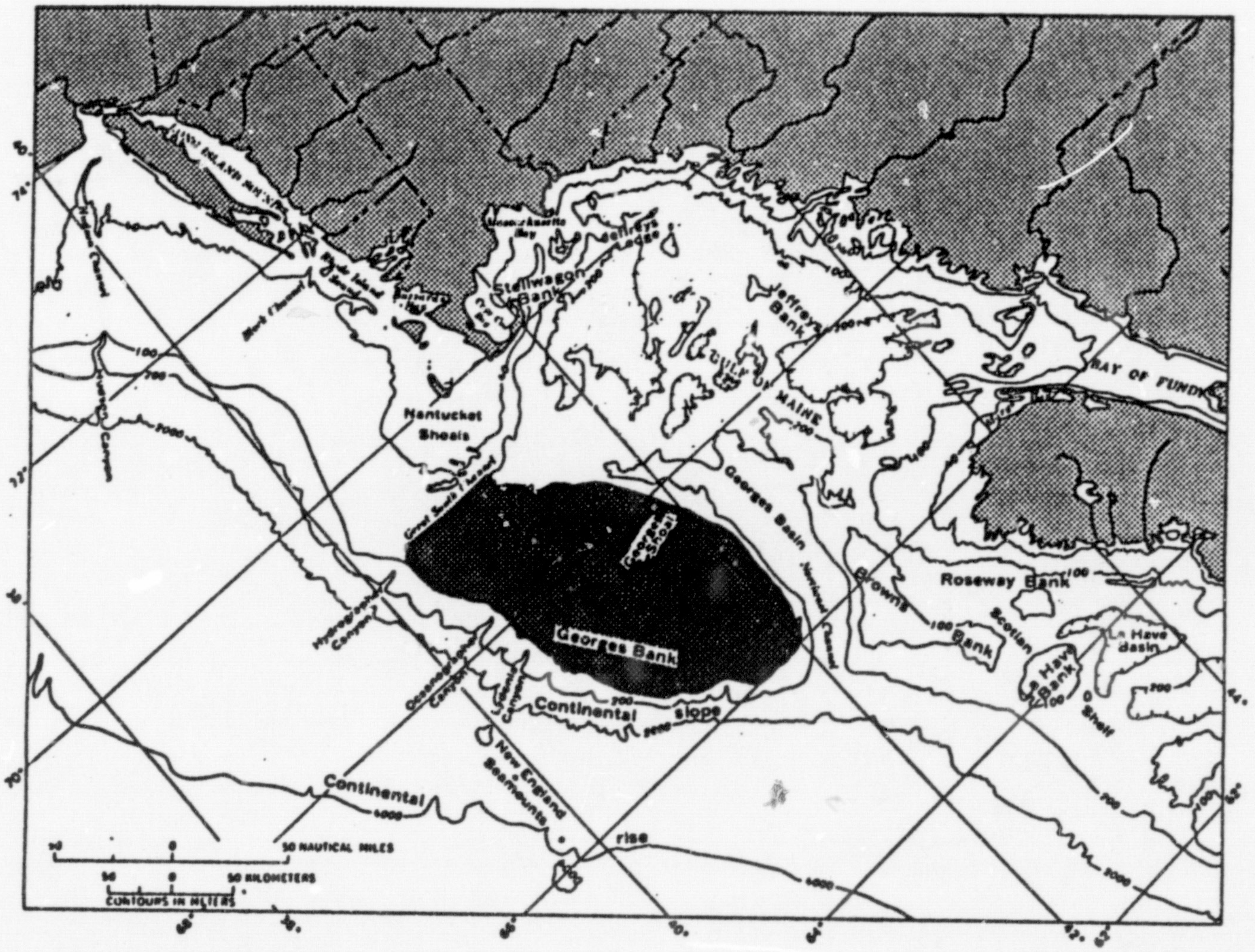
Schedule of Oil Development on New England O.C.S.

The present schedule of the Federal Department of Interior to lease tracts on New England's O.C.S. is as follows; however, it must be remembered that to date the schedule has been revised and accelerated on several occasions.

April, 1975 - Call for nominations of tracts
June, 1975 - Tract nominations due
July, 1975 - Baseline studies initiated
August, 1975 - Announcement of tracts
November, 1975 - Tract draft environmental statement released
January, 1976 - Public hearing on tract draft E.I.S.
March, 1976 - Final tract environmental impact statement released
April, 1976 - Notice of tracts sale
May, 1976 - Sale of tracts

Scope of the Environmental Impact Statement

Although the statement covers over 1,300 pages including references and appendices the scope of the report is inadequate. In reality even though the report has the format of an E.I.S., it is not much more than an infor-


Stellwagen Bank
Jeffreys Ledge
Jeffreys Bank
GULF OF MAINE
BAY OF FUNDY
Nantucket Shoals
Great South Channel
Georges Shoal
Georges Basin
Northeast Channel
Georges Bank
Browns Bank
Roseway Bank
Scotian Shelf
La Have Bank
La Have basin
Hydrographer Canyon
Oceanographer Canyon
Continental slope
Continental rise
New England Seamounts
100
200
2000
4000
50 NAUTICAL MILES
50 KILOMETERS
CONTOURS IN METERS

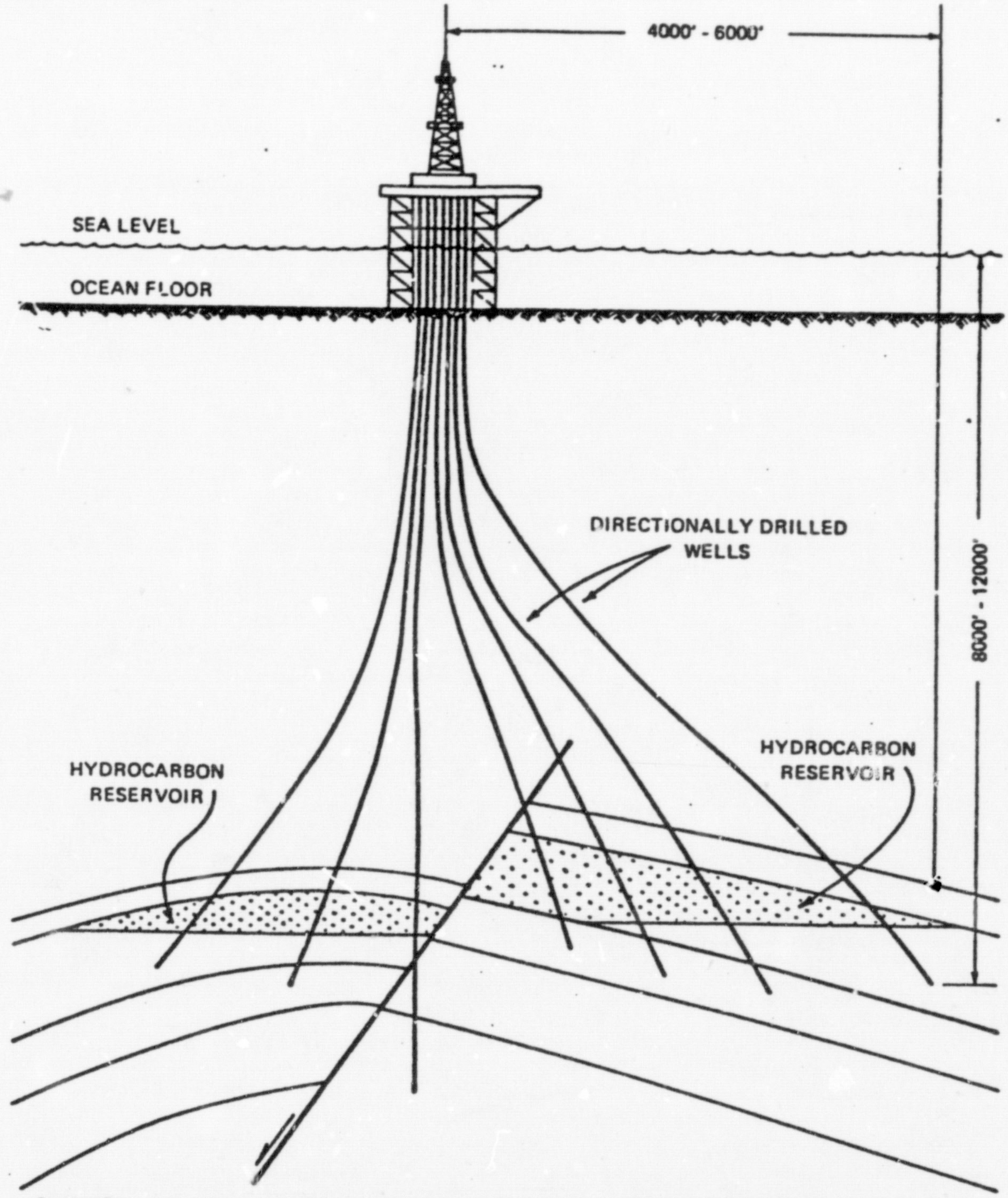
-Bathymetric map of the continental margin off the Northeastern United States. (from Schlee, 1973; after Uchupi, 1965).

mational document. In that light the E.I.S. does a good job of trying to show the types of activities which will be happening if O.C.S. oil and gas are developed. The major problem is that an E.I.S. is supposed to address in depth the environmental impacts of a proposed action. Environmental impacts are explored, but in most cases it is impossible to adequately evaluate the extent of those impacts because throughout the report statements of impact are "balanced" to place possible environmental harm in the best light. The National Environmental Policy Act (N.E.P.A.) requires that an E.I.S. include a section specifying measures to mitigate impacts; however, this type of rationale has been expanded to include many of the discussions in the document. Thus, it becomes impossible to obtain a clear and true picture of the possible extent of the individual impacts. Some examples typifying this "balancing" technique are as follows:

> Volume II: page 158
>
> The initial development would probably be the most traumatic in frontier areas, as it would necessitate intensive development of rig construction and transportation areas, an influx of new, specialized employees, construction of pipelines and onshore terminals and treating facilities, initial impacts on biota of all types of many of the noxious substances attendant to O.C.S. oil and gas development (oil, drilling muds, formation waters), and restrictions on commercial fishing activities, among others. ...This will probably be true even in frontier areas that are already stressed by oil pollution, because of the variety of new loads which will be introduced into these frontier area ecosystems. Some accomodation and adaptation can be expected to occur over time. This can be inferred from the apparent health of the Gulf of Mexico ecosystem, where commercial fish catches of all types have either held steady or increased over the last 25 years, both in total catch and catch per unit effort.

> Volume II: page 170
>
> Although formation water [from the oil well] is put through a polishing facility and has all but traces of entrained oil removed (not greater than 50 ppt, average) it may contain a heavy concentration of dissolved salts and is anoxic (devoid of dissolved oxygen). It could be anticipated that the release of this water would result in a plume trailing away from the point of discharge in the direction of the current with a core perhaps a few feet in diameter and tens of feet in length. This plume would probably be harmful or lethal to the plankton. Physiological stress would probably result from an osmotic imbalance (cells losing water to surrounding brine) and low or [no] dissolved oxygen. Beyond the zone of stress, however, Mackin (1971) noted a zone of stimulation or fertilization during a study of brine discharge in Galveston Bay.

> Volume II: page 160
>
> Discharge from drilling rigs represent another impact-producing aspects of operations. Drilling is accomplished with a colloidal suspension called drilling mud which cools the drill bit, carries off drill cuttings, and maintains outward pressure inside the hole. This mud is a combination of numerous specialized chemicals. These chemicals contain


4000' - 6000'
SEA LEVEL
OCEAN FLOOR
DIRECTIONALLY DRILLED WELLS
8000' - 12000'
HYDROCARBON RESERVOIR
HYDROCARBON RESERVOIR

Source: Paper by C.C. Taylor, Exxon Company, U.S.A., "Status of Completion/Production Technology for the Gulf of Alaska and the Atlantic Coast Offshore Petroleum Operations," presented at the Resources for the Future, Inc., seminar, Washington, D.C., Dec. 5-6, 1973, conducted for the Council on Environmental Quality under contract No. EQ4AC003.

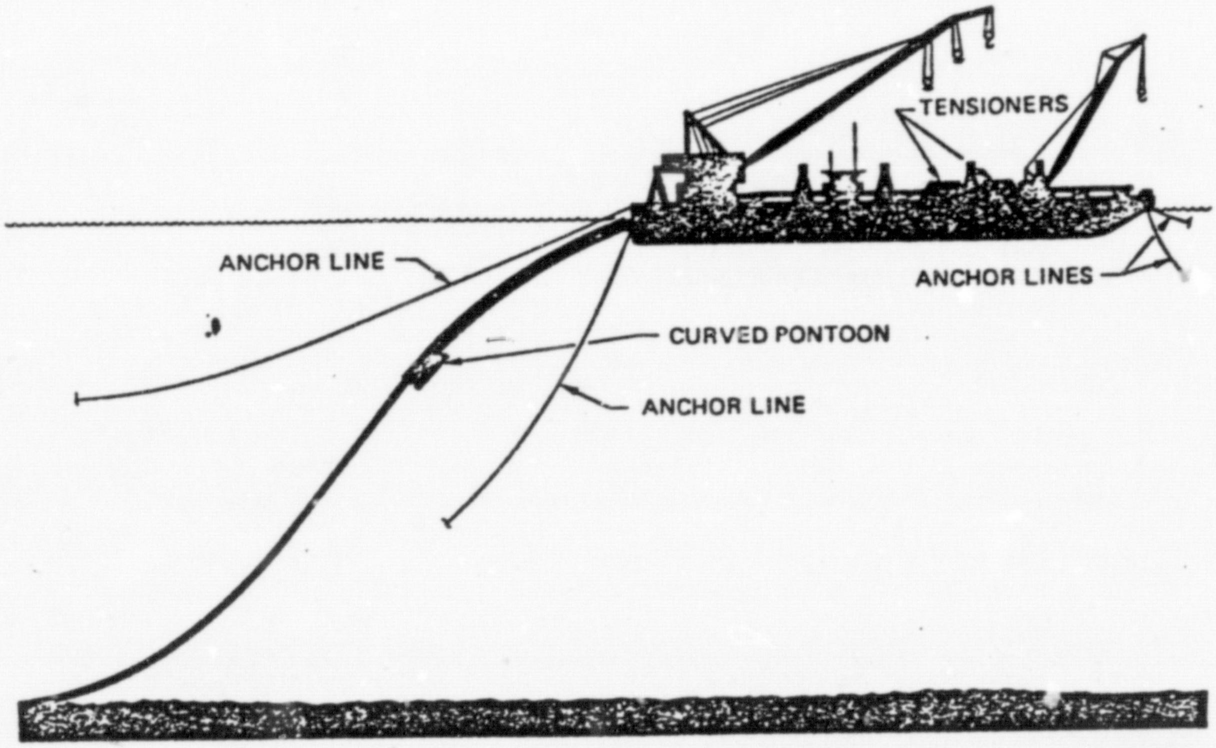
Figure 4-8. Typical Directionally Drilled Wells

> elements and compounds which, while usually present to some degree in seawater, represent an unknown factor that may be deleterious to marine organisms and communities. Several compounds are known to be toxic to fresh water fish in usage concentrations. ...However, many toxicities are determined in laboratories, and field conditions are distinctly different.
>
> Volume II: page 195
>
> Bays and estuaries are usually highly productive ecosystems. Detrimental effects upon the primary productivity of these ecosystems would result in a decrease in the planktonic food supply of the large menhaden, shrimp and other fisheries in addition to directly toxic effects of crude petroleum on the fauna and flora. Ketchum (1973) cautioned that while effects of petroleum depend upon proximity to and type of oil released, "Any release of oil into the environment carries a threat of destruction and constitutes a danger to world fisheries."
>
> However, other authors believe the adverse effects of petroleum hydrocarbons on the biotic communities of Louisiana (where oil and gas development have been the most intensive) are less significant.
>
> St. Amant (1973), speaking of the oil producing structures in the bays, offshore areas and marshes of Louisiana, stated:
>
>> "Louisiana's coastal areas with more than 25,000 producing wells, with some fields that have been in production for more than 40 years, and most of which have existed for 20 years, serves as a type area of high production and long-term pollution."
>
> ... While studies cited previously in this section indicate the retarding effect of petroleum on primary productivity, it is St. Amant's opinion based on his experience that there has been no decrease in overall productivity in Louisiana resulting from introduction of crude oils into the ecosystem (St. Amant, 1973).

The extent of the real knowledge about the outer continental shelf becomes more apparent if some of the phrases are more carefully examined. For instance, some of the phrases which occur as qualifiers in the above paragraphs are:

...would probably be...
...will probably be true...
...can be expected...
...can be inferred...
...may be deleterious...
...can be anticipated...
...would probably result...
...other authors believe...
...it is St. Amant's opinion...

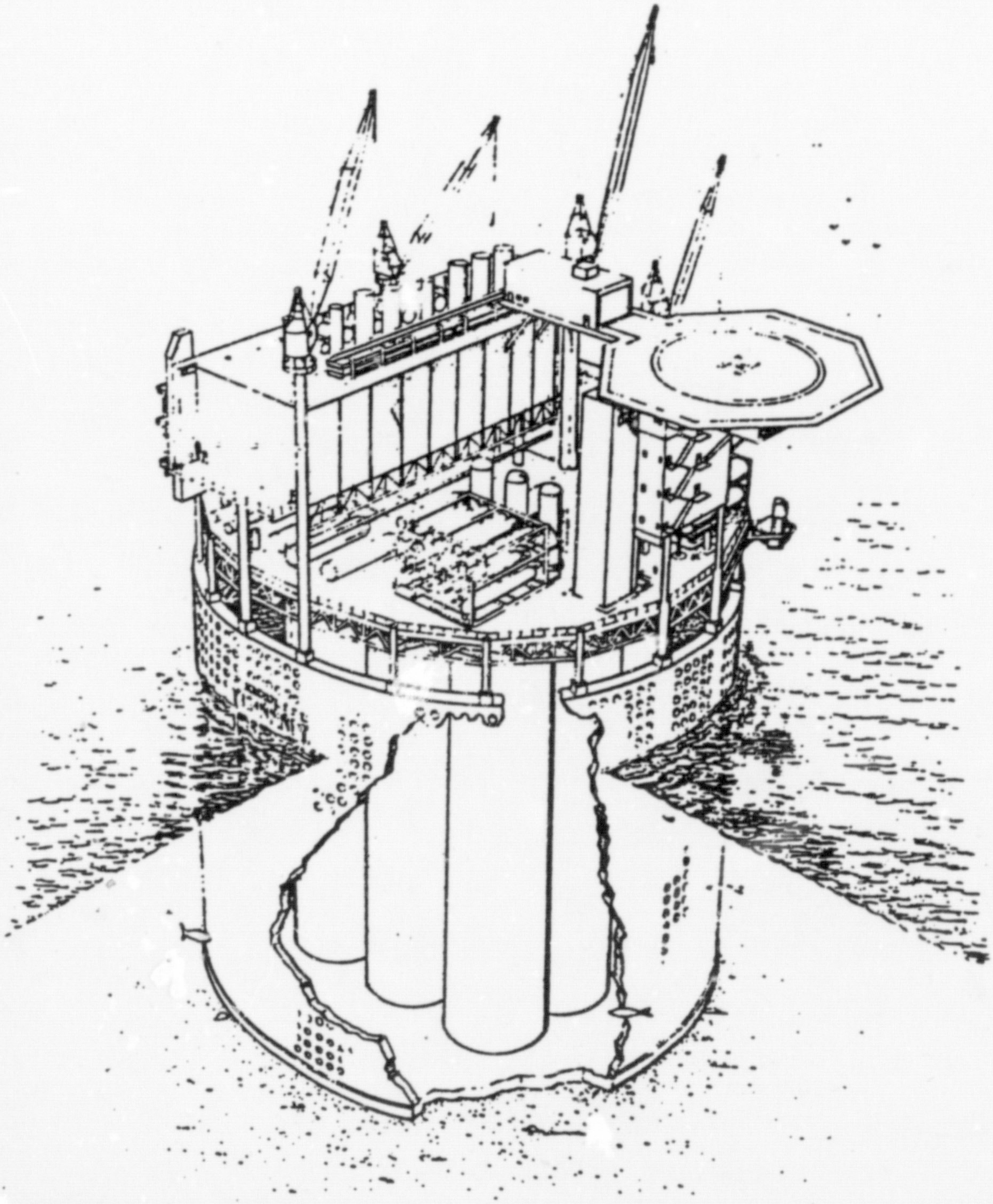
Journeying into new "frontiers" has not been a new concept, especially in the recent past as exemplified by the United States' pioneering moonflights. However, there is a distinct difference between that Federal action and the proposed oil and gas leasing of O.C.S. frontier areas. In the former case very careful and detailed plans were explored, alternatives examined and then the best possible choices made. The Government's position on oil and gas


TENSIONERS
ANCHOR LINE
ANCHOR LINES
CURVED PONTOON
ANCHOR LINE

Source: Paper by W.B. Pieper, Senior Vice President, Brown & Root, Inc., "Construction of Oil and Gas Pipelines and Oil Storage Facilities on the Outer Continental Shelf," presented at the Resources for the Future, Inc., seminar, Washington, D.C., Dec. 5-6, 1973, conducted for the Council on Environmental Quality under contract No. EQ4AC003.

Figure 4-10. A Lay Barge with Curved Pontoon

leasing is analogous to starting construction of a bridge, while the engineering plans are still on the drawing boards. The E.I.S., which is supposed to illuminate O.C.S. plans and add input to the decision-making process, is merely a "shouting match" between conflicting opinions concerning environmental impacts. It does little or nothing to address those impacts in depth and come to logical solutions or remedies. The greatest service that that E.I.S. has performed is to show how extremely deficient our knowledge is about the outer continental shelf.



Source: Tetra Tech, Inc., 1973, "The Effect of Natural Phenomena on OCS Gas and Oil Development," prepared for the Council on Environmental Quality under contract No. EQ4AC010.

Figure 4-11. The Phillips Petroleum Underwater Storage Tank Being Installed in the North Sea

II.- Description of the Environment

Report Deficiencies

1.- Geological Hazards - Volume I: page 192

Seismic activity for the Georges Bank area is covered in two pages of text, and one chart of the Mercalli Intensity Scale of earthquakes. One paragraph discusses the 1755 major earthquake at Cape Ann and suggests that the seismic activity occurred along a line which would have passed through the central portion of Georges Bank. However, it concludes that no offshore seismic activity exists.

No mention is made about a large, submarine landslide or "turbidity current", which occurred along the Atlantic continental slope in 1929. This underwater slide occurred off the Canadian Grand Banks and extended over several hundred miles of ocean bottom, moving down the continental slope at approximately 15 to 20 miles per hour. It caused many breaks in trans-Atlantic cables and moved hundreds of tons of unconsolidated materials over great distances. This type of phenomenon could be associated with New England's outer continental shelf and slope, but submarine slides have not been addressed in the E.I.S.

2.- Climate - Volume I: page 207

This section covers in very general terms the types of climatic conditions that are experienced along the entire Atlantic seaboard. Of that section only a few paragraphs deal with the North Atlantic region, and then only in average values for temperature, precipitation, etc. Storms are discussed in this section; however, no specific examples are cited for the Northeast region.

3.- Physical Oceanography - Volume I: page 216

This section is totally inadequate and far too general to be of use in describing the environment of Georges Bank. An example of this is the following paragraph:

> Slope water which is found north of Cape Hatteras is formed by mixing from oceanic water and river effluents, and tends to have consistent physical properties throughout its range (Bumpus, 1973). Coastal water is formed by 1) the addition of slope water on the southern edge, 2) an influx of water through the Northeast Channel from the Scotian Shelf, and 3) an influx of estuarine water and occasional intrusions of Gulf Stream water.

Although the statement does describe the overall components of Atlantic waters, it is not specific enough to describe Georges Bank. The same comment applies to individual components of the physical properties. The Surface Sea Temperatures has one paragraph on the Georges Bank as follows from page 222, Volume I:

> The Bay of Fundy and Georges Bank are areas of sufficient tidal mixing to inhibit the formation of a summer thermocline. A large range of sea surface temperature exists between the coastal water and slope water throughout the year. Slope waters show temperature gradients during

winter, and essentially isothermal conditions during fall and spring, due primarily to wind induced mixing. Coastal water is affected by seasonal air temperatures and river runoff. Summer sea temperatures decrease from southwest to northeast offshore the Gulf of Maine and increase on the bottom in the same direction.

Likewise, the topics of Salinity, Surface Circulation, Tides, Sea and Swell, and Ice Conditions have one paragraph to one page on the Georges Bank with the former length predominating.

The description of the Biological Environment starting on page 237, Volume I is somewhat longer, but again lacks the depth necessary to properly assess impacts. The sections on Phytoplankton and Zooplankton amounts to little more than a listing of species that predominate in the ocean environment, but fails to show the dynamic interaction of these species. There is for instance no discussion of food webs or chains to show how the various species are dependent upon one another for food sources and thus energy for survival.

4.- Benthic Biota - Volume I: page 247

Benthic biota or the animals of the ocean bottom is overly embellished with mollusks (clams, snails, etc.) and ignores most of the other invertebrates that are associated with this environment on Georges Bank. There is an inadequate description of this regime.

5.- Nekton - Volume I: page 252

The nekton section covers the "active swimmers" in the ocean and is eight pages, of which approximately three pages deal with an inventory of fish and mammals of the North Atlantic.

6.- Birds - Volume I: page 260

Birds of the Atlantic coast are covered on one page and with such general statements about them that no conclusions could be drawn from the description. Typical of the sentences is:

> Marine birds feed on fish, plankton, and detritus. Fish-eating birds return nutrients from the water back to shore and are instrumental in recycling nutrients within the surface layer. ...Sea birds also utilize the shoreline for breeding and the raising of their young.

7.- Nearshore and Coastal Zone - Volume I: page 553

This section on the nearshore and coastal zone environments is completely deficient in its attempt to describe several environments. Rocky Shores covers one page; Beaches including barrier beaches, three pages; Salt Marshes, two pages and a diagram; Shellfish and Worm Flats, three pages; and Salt Ponds and Estuarine Systems three pages.

Beside the fact that there are some erroneous statements, far too often the E.I.S. extrapolates from the general to the over-simplified, by saying that a situation in the Gulf of Mexico or North Carolina can be used to represent the Northeast when in fact there are vast differences. An example of an erroneous statement is found on page 566, Volume I, under the section on Barrier Beaches:

> The beach and dune system receives sand from wave transport on the seaward edge and is continually moving landward. This progression results in a succession of habitat types behind the dunes.
>
> Man has attempted to stabilize these dunes with snowfenced and artificial plantings of dune grasses. These efforts have resulted in the erosion of the beach and ultimate erosion of the foredune system (normally a continuous dune closest to the surf zone). (Underlining supplied - both underlined statements are incorrect).

On page 568 the E.I.S. further discusses barrier beaches and illustrates the sweeping generalization alluded to above:

> Storm generated waves have breached the barrier island system repeatedly, causing wave overwash across the islands into the marshes behind them. This phenomenon results in disruption of the normal community and may require several years for significant recolonization. The salt marshes are generally dominated by Spartina alterniflora, S. patens, and Juncus geradi.
>
> The above description holds for the entire Atlantic coastline where barrier beaches occur.

8.- Georges Bank Commercial Fishery

There is a one page discussion of the commercial fishery of Massachusetts on page 665, Volume I, where pounds of fish landed are compared to value received. A few of the fish species caught in the Gulf of Maine, including Georges and Brown's Banks, are listed on pages 256 and 257. In no part of the E.I.S. is there a discussion of the Georges Bank fishery and its relationship to New England, the United States, and other nations of the world.

9.- Water Quality - Volume I: page 696

The water quality of Massachusetts is portrayed in the E.I.S. by the following paragraph:

> The coastal waters off Massachusetts are polluted to levels which curtail the commercial shellfish industry. Recreational pursuits have been reduced and ground water is apparently being degraded by industrial wastes and sewage. Coastal sewage loading from commercial vessels and recreational boating is blamed for a significant input of untreated sewage. Population growth is presently exceeding the capabilities of local sewage treatment plants and the coastal situation is predicted to worsen (URI, 1974).

By the tone of this quote one would get the impression that Massachusetts must surely have the worst water quality in the nation, or perhaps the world. It would appear that the statement was completely taken out of context from the University of Rhode Island report, but in any case is an absolutely inaccurate account of the state's water quality. Nevertheless, the impression and implication left by the statement is that a little more pollution by oil can not make the situation any worse.

III.- Environmental Impacts of the Proposed Action

This section deals with the type of environmental impact New England could expect, if the leasing of tracts and production of oil and gas becomes a reality on the outer continental shelf. The E.I.S. describes many of the primary effects of oil and gas development; however, secondary effects are treated only lightly. Some excerpts from the report would be appropriate:

1.- Oil Spill Impacts - Volume II: page 157

> The most severe impacts that can affect organisms and communities of marine and coastal ecosystems are those that result from spilled oil. It is important to point out that predictions of effects at the community, or even population, level can not be determined from the existing literature. Rarely has an area been well-enough characterized environmentally that the changes caused by a massive oil spill or chronic pollution can be identified. Several studies have been conducted during and after oil spills in areas that were rather well known qualitatively. These include the various studies at West Falmouth by scientists at Woods Hole and others, the oil blowout at Platform "A" in the Santa Barbara Channel, and the tanker groundings at Milford Haven and Cornwall, England. Quantifiable comparisons were not possible in these areas due to a scarcity of quantification of population levels and dynamics preceding the spills.
>
> This inability to quantify the effects of large oil spills makes the prediction of impacts resulting from the ten million acre proposal an extremely difficult task that can be done only in qualitative terms in most cases.

2.- Pipeline Impacts - Volume II: page 159

It can be expected that most of the oil produced on the O.C.S. would be shipped ashore by pipeline as it is with 98% of the oil from the Gulf of Mexico:

> Pipeline burial in submerged waters, and pipeline crossing of onland habitats is perhaps the second most severe impact-producing aspect after oil spills. Pipeline burial produces effects similar to dredging activities, i.e. increased turbidity and resuspension of toxic materials normally trapped in sediments. Pipelines crossing beaches and wetlands cause short-term one time effects, but, in marshes especially, the pipe channels, access canals necessary for construction equipment, and dredge spoil banks remove habitat and cause drainage and circulation modifications.

3.- Onshore Impacts - Volume II; page 161

The E.I.S. summarizes onshore impacts on the living component of the environment in this manner:

Another impact of note is the onshore loss of habitat from the construction of new pipeline terminals and treating facilities. In some instances, new refineries are built; these too result in loss of habitat, as well as degradation of air and water quality. It is difficult to predict whether new refineries will result from the proposed increase acreage leased. Projections of increased production of oil do not equal the current level of imported crude, so production from this proposal could be assimilated by existing refineries. The possibility of new refineries is more a geographic-transportation problem.

4.- Plankton Impacts

The magnitude of impacts upon the planktonic organisms of the ocean can be illustrated from some statements contained in the E.I.S.:

Volume II: page 160
Drill cuttings themselves are discharged overboard after being cleaned of any extrained (sic) oil. However, they do cause smothering of organisms when they cover the bottom, and the finer sediments trail away as a plume from the discharge spout, possibly causing turbidity related problems to organisms when they settle out. Formation waters (from within the geologic structures) have a high salt content and are usually devoid of oxygen. These waters are also dumped overboard, possibly causing localized disruptions to phytoplankton and zooplankton productivity.

Volume II: page 162
Impacts that may be anticipated to have an effect on plankton will result from accidental spills of oil and other toxic materials, discharge of drilling fluids and formation waters, and burial of pipelines.

After an oil spill has occurred, that oil which has not evaporated, been carried ashore, or cleaned up will float at the surface for a time and eventually be dispersed as minute droplets in the water. In addition, certain components of crude oil are slightly soluble in seawater. In each of these three phases (floating, droplets, solute) the oil has the opportunity to damage marine organisms and/or enter the marine food web. The organisms most immediately and drastically affected are those which are found in close proximity to the sea surface.

Volume II: page 165
Little information has been found concerning the effect of crude oil on the zooplankton. ...Members of the Operation Oil Tank Force (1970), studying the effects of spilled Bunker C from the tanker Arrow in Chedubucto Bay, Nova Scotia, observed that many copepods [a type of plankton] in the area had apparently ingested small oil particles and 2.4% Bunker C was found in the feces of one species. They noted that animals containing smaller oil particles voided these within 24 hours and showed no sign of distress. That they continue normal activities

with no apparent harm is quite important to higher trophic levels in the marine food web, because they can be eaten by small fishes and filter-feeding organisms while carrying the oil in their guts. The fish and filter-feeders may in turn be eaten by larger predatory animals, establishing the potential for a classic example of biological magnification of a potentially harmful or toxic compound.

> Volume II: page 169
> We believe that the plankton populations in the various geographic areas will be able to absorb the impact of a major oil spill and recover fairly rapidly. (Emphasis supplied).

Report Deficiencies

The above mentioned impacts suffer from the same degree of lack of depth as other components already discussed. They represent qualitative summaries of proposed activities when the activities should be addressed in strictly quantitative terms.

It may well be true that past studies on oil spills have been handicapped by the lack of pre-spill data; nevertheless, it is fallacious to suggest that it is impossible to quantify and thus increase knowledge about oil spill impacts. There is almost a fatalistic attitude about the possibility of investigating some of the impacts, seemingly because of their magnitude. The problems are portrayed as approaching the realm of insolubility. Such is not the case.

Pipeline burial and onshore impacts are so scantily discussed that they lack the degree of specificity which would adequately describe the problems. This is particularly true of the onshore impacts, which has proved to be the major problem in the development of the North Sea "frontier" area. To dismiss onshore impacts of new refinery construction as a "geographic-transportation" problem ignors the whole issue. In a study performed for the Council on Environmental Quality by Resource Planning Associates, Inc. it was concluded that high level production of O.C.S. oil would utilize 17% of the undeveloped land suitable for primary development in Eastern Massachusetts and Rhode Island.

In the section on plankton the authors of the E.I.S. have inadequately elucidated the impacts to this component of the ocean environment. They maintain that this type of knowledge is incapable of being obtained, and say on page 186, "Our present state of knowledge does not allow us to quantify the impacts of expanded leasing on phytoplankton and zooplankton." The authors appear to have no grasp of the potential impacts to plankton and can only conclude with the conjecture statement beginning "We believe...". Major policy decisions should not be made on supposition when science and technology can be effectively employed to investigate, substantiate and demonstrate reasonable alternatives.

IV.- Alternatives to the Proposed Action

This section of an E.I.S. is supposed to be concerned with the alternative ways in which supplies of energy could be increased. The E.I.S. relates many different types of energy sources, such as:

Nuclear power;
Hydroelectric power;
Solar energy;
Synthetic natural gas and oil;
Coal
Oil shale
Liquified natural gas
Geothermal energy

Also discussed are alternative options concerning energy procurement, such as:

Modified O.C.S. leasing plan
No increase in O.C.S. leasing
Postpone O.C.S. leasing
Discontinue O.C.S. leasing
Increase oil and gas imports
Increase onshore oil and gas production
Increase energy conservation

Report Deficiencies

Although the E.I.S. explores many different alternatives in energy sources, it does not analyze the advantages or disadvantages of using one fuel or mode over another. The alternatives given amount to little more than a shopping list with each item treated independently of the others. There is no in-depth analysis which would show the types of fuels and modes on a comparative basis, and there are no overall conclusions after describing each of the alternatives. The section should include an analysis of this kind to demonstrate that in fact oil and gas drilling is the best alternative among the choices presented. This has not been done.

The stated aim of the E.I.S. is to address the policy of increasing acreage of O.C.S. oil and gas leasing but in fact the report fails to explore the alternative policies that could be formulated. Instead the E.I.S. makes the assumption that Project Independence is the only policy, and there remains just the problem of how it shall be implemented. With the philosophy of the "self-sufficiency" proposal being non-dependence, or significant curtailment of dependence on foreign, energy imports, will there be a furthering of United States oil companies control of the market, now with Government sanction? In recent years the "free enterprise" system functioned upon a basis of competition from foreign countries, and this generally applied to the petroleum industry as well. If Project Independence is carried to the non-dependence level, there will be no foreign imports against which the U.S. industry can compete. An analogy for the policy of Project Independence could be made using the auto industry. For instance what would be the consequences, if the President said, "By 1985 the United States will be free from foreign, auto imports". This type of policy could lead to a monopoly, therefore other policies should have been explored.

V.- Conclusions

The E.I.S., submitted by the Bureau of Land Management on O.C.S. oil and gas leasing, can not in any manner be considered an adequate document in spite of its 1,300 page length. It is a review of the activities and potential impacts associated with O.C.S. development, and presented in summary fashion. The document does not present a sufficiently thorough and correct analysis from which to proceed to the next step in the process, the call for nomination of tracts. This action will take place for Georges Bank three months from now, in April, 1975. The entire report is an example of the "sin of omission". It must be greatly criticized for the things that are left out rather than the items which have been included. There is for many important topics only a glossing over of the available material, and even then much of the information presented is less comprehensive than an introductory textbook on the matter.

If there could be one great deficiency of the E.I.S. it is that the document fails to show the dynamics of potential impacts. The authors have presented the materials as if the environmental impacts were static entities, entirely independent and completely divorced from each other. This applies to all of the topics discussed from physical oceanography and biological systems to onshore developments and economics. This type of thinking is not only passé, but is actually damaging to the proposed project. By inadequately describing the project, appropriate alternatives can not be explored and correct decisions made.

There are actually many more question raised by the E.I.S. than are answered. Some of these might be:

1.- What is the extent of impact on the commercial and non-commercial fisheries of New England, including oceanic and land impacts?

2.- What are the economics of O.C.S. development to New England, including financial arrangements, employment prospects and flow of dollars through the region?

3.- What are the specific land impacts including amount of land needed in each state, type of facility to be located, which areas of the states are best suited for the development, and attendant visual impacts?

4.- What secondary impacts can be expected to be generated, including shifts in population within and between states, housing requirements and associated services?

5.- Will the development of O.C.S. oil and gas mean direct benefits either in more amounts of petroleum to replace the heavy reliance on imports, or a reduced price for the product?

6.- What will be the effects of Project Independence on the New England region, which is so heavily dependent on imported oil?

RECOMMENDATION

The Federal, programmatic Environmental Impact Statement should be designated as not being an adequate document according to the National Environmental Policy Act. All phases of the policy to expand the Outer Continental Shelf oil and gas offerings have been inadequately assessed. They should be more intensely investigated to present an in depth analysis which properly addresses the potential impacts.

The step following an approved, programmatic E.I.S. should be the preparation of a regional E.I.S. which would demonstrate O.C.S. concerns as they pertain to New England. This should be done prior to the preparation of the site-specific Environmental Impact Statements.

Review Of The Draft Environmental Statement
For The Proposed Increase In Acreage To Be Offered
For Oil and Gas Leasing On The
Outer Continental Shelf, DES 74-90

by

Members of the Faculty of the
University of Massachusetts, Amherst

In cooperation with the
Center for Environmental Policy Studies
Institute for Man and Environment

for the Massachusetts Energy Policy Office
and the Massachusetts Coastal Zone Program,
Executive Office of Environmental Affairs

January 1975

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Introduction

This report is a review of the Draft Environmental Statement for the Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf, DES 7490, which was prepared by the United States Department of the Interior. This review was done by University of Massachusetts, Amherst faculty in conjunction with the Center for Environmental Policy Studies, Institute for Man and Environment for the Executive Office of Environmental Affairs' Coastal Zone Program, and the Massachusetts Energy Policy Office. The comments contained within the main body of the report are the result of a workshop session attended by the faculty listed below as well as staff members from the Executive Office of Environmental Affairs' Coastal Zone Program and the Massachusetts Energy Office. Notes were taken by Ronald Woodland and Joyce Young from the Center for Environmental Policy Studies, IME, and the workshop text was compiled by Joyce Young.

The following faculty are contributors to the review:

Faculty Member	Department
Dr. Larry Ambs	Mechanical and Aerospace Engineering
Dr. Charles Cole	Forestry and Wildlife Management
Dr. Paul Godfrey	Botany/National Park Service Coastal Research Unit/Institute for Man and Environment
Dr. Leigh Short	Chemical Engineering
Dr. Gregory Webb	Geology
Dr. Harry Schwartzberg	Food and Agricultural Engineering
Dr. Arthur Wright	Economics
Dr. John Zahradnick	Mechanical and Aerospace Engineering - University of Massachusetts Aquacultural Laboratory

Ervin H. Zube, Director
Institute for Man and Environment

Richard C. Smardon, Associate Planner
Executive Office of Environmental Affairs

Summary

In summary the major problem areas with the E.I.S. are:

1. The description of the environment is in general inadequate. Old data is used in many cases when more current data are available, e.g., land use (SENE data), and biological. In the biological section improper references and generalizations are drawn from the data actually cited. The report also treats the living environment as a static phenomenon rather than as a dynamic one, which might be more realistic in trying to determine impacts. See IME comments 2-8.

2. The discussion of impacts of the proposed action is in general superficial, particularly in reference to the nearshore and coastal zone environments. Secondary or indirect impacts such as induced development would appear to be grossly underestimated if the North Sea (which is most comparable to the North Atlantic) development is viewed as an example. The discussion of impacts on beaches and related coastal areas ignores the dynamics of high energy beaches and the full range of uses to which beaches in general are put. Also, pertinent facts or estimates are missing as to the expected frequency, nature, source, and movement of oil spills. See IME comments 9-20.

3. Mitigating measures and alternatives to the proposed action are addressed in an incomplete or superficial manner. Attention should be directed to the probable efficiency of various mitigating measures in the widely differing regions under consideration. See IME comments 21-24.

4. The State/Federal jurisdictional overlap in terms of potential measures to minimize harm is especially critical in view of the potential impact on the coastal zone itself. States need to be prepared to deal with these impacts as soon as possible. Mitigating measures addressing joint federal/state programs (such as Coastal Management Programs) which could serve to minimize potential impacts should be included in this nationwide E.I.S. and further developed in the regional E.I.S.'s. See IME comments 25, 26.

5. Alternatives should include exploratory drilling or lesser amounts of acreage proposed for leasing. There also should be a more complete discussion of each alternative, especially regarding differences in potential impacts. See IME comments 28-31.

6. Trade-offs are not clearly identified from section to section within the E.I.S., especially within the sections on alternatives, proposed measures to minimize unavoidable adverse effects; and irreversible and irretrievable commitments of resources. There should ideally be a recognizable structure for the entire E.I.S. to enable the reader to more easily identify the trade-offs while progressing from one section to another.

I. Description of the Proposed Action

1. Henry Schwartzberg (Ag. & Food Eng. Dept.) Historically there have been spills (blow-outs). For example, it has been found that blow-out control equipment has proven to be deficient 3.6% of the time. Significant deficiencies have been found even in well-monitored programs (e.g. Gulf of Mexico). Therefore there are likely to be similar spills in the New England OCS area. (Prevailing winds are such that most of the spilled hydrocarbons will be carried out to the open ocean).

II. Description of the Environment

A. Description of the Offshore Environment

1. Atlantic Region

a. Geology

2. Gregory Webb (Geology Dept.) The description of subsurface geology is adequate, but much better data exists than has been used (unpublished company data.) Little has been said concerning the detailed geological structures present. This may be due to the sparcity of published data. There are not many conclusions concerning the possible productivity of the area. This unknown depends upon more exploratory drilling, initial results of which seem discouraging.

Since the whole of Georges Banks (9ft - 500 - 600ft) is accessible, there is the possible danger of two kinds of underwater land movements:

1) Scouring and unstable sand washing out around equipment on the shelf. (1st call will be on continental shelf).

2) Sand and mud slides on the slopes (2nd. call will be on slopes.) The frequency of these slides in the last 50 years is not known.

As there are strong tidal currents with sand waves on Georges Bank, procedures which have worked in the North Sea, with its strong tidal currents, should be able to be used here.

There is some danger from seismic activity along the Cape Ann Line, which has historically produced an earthquake in Cape Ann and Charleston, S.C. 100 years ago. Any area, though, could have an occasional earthquake. This would be more relevant for pipeline and refinery construction, rather than for drilling rigs (which are built to withstand hurricanes).

d. The Biological Environment

3. Charles Cole (Fisheries Dept.) The ichthyoplankton community, which is the basis for the fisheries, has not been discussed. In general, the ecosystem was considered only in a static, not a dynamic sense.

B. Description of Nearshore and Coastal Zone Environment

4. John Zahradnik (Mech. & Aero. Eng. Dept.) A lot of information has been included but it is not up-to-date, i.e.:

    1) on p. 373, the WHOI comprehensive report on the Falmouth Oil Spill should be mentioned.

    2) on pp. 371-372, stresses on oysters have since been relieved.

    3) on p. 396, it implies that the water quality off Mass. is worse than it actually is. There are areas of good water quality, but only the worst areas have been documented.

5. Ervin Zube (I.M.E.) The land use data is also not current.

6. Gregory Webb (Geology Dept.) Geological description is adequate.

7. John Zahradnik (Mech. & Aero. Eng. Dept.) The sociological awareness of the value of nearshore and coastal areas by townspeople has not been adequately addressed.

8. Paul Godfrey (Botany Dept.) Some parts are adequate, but on the whole, the biological section is poor. The data is sketchy and has overlooked much information about Mass. It is erroneous to generalize about Atlantic communities by lumping all the diverse kinds together from Maine to North Carolina.

    The diagram of the x-section of a barrier island on p. 569 is from one of Godfrey's papers and is inaccurately applied in this report, to the entire Atlantic Coast. It is true for only that particular area.

    A lot of material has been used from 1-2 sources, but the rest of the comprehensive literature has been omitted.

There have been no details presented on the dynamics of the inshore or coastal biological systems, especially saltmarshes, food chains and how they work and long-term changes, effects of oil pollution, etc.

East coast saltmarshes and estuaries should be inventoried and their ecological condition presented.

In total, the section was very inadequate.

III. Environmental Impacts of the Proposed Action

B. Impact on Offshore Environment

9. Charles Cole (Fisheries Dept.) The effects of sea surface oil films on zooplankton larval stages of sea scallops and lobster has not been discussed.

10. Paul Godfrey (Botany Dept.) What are the effects of oil on fish and on nutrient levels (effects on phytoplankton)?

C. Impact on Nearshore and Coastal Zone Environments

11. Ervin Zube (I.M.E.) Presentation was quite superficial. New England should be related to conditions in the North Sea, rather than to nonapplicable areas in the U.S. There have been no dynamics of impact analysis given.

12. Paul Godfrey (Botany Dept.) As in other sections, the important areas have only had a superficial treatment. Many important papers have been omitted. A number of things have been underestimated in several areas: see Paul Godfrey's comments.

    The role of beaches, wetlands, and salt marshes in nutrient recycling should be addressed. They do have other uses besides recreation and aesthetics. What are the effects of oil on detritus breakdown products in marsh and offshore areas?

    The impact of burying pipes on high energy beaches in New England is not addressed well. How would sand transport, freezing temperatures and other adverse environmental conditions affect the pipe in beaches, saltmarshes and estuaries?

13. John Zahradnik (Mech. & Aero. Eng. Dept.) The impacts of oil pollution should be projected from one area to another. There is no mention of the effects of oil on larval stages.

14. Richard Smardon (EOEA) Old data has been used and even then, the reports have only been skimmed. The effects on recreation are inconsistent.

D. Impact on Air and Water Quality

15. Richard Smardon (EOEA) What is the impact on an already stressed ecosystem?

16. Arthur Wright (Economics Dept.) If there is drilling for oil off the Mass. Coast, what area will it supply? Trade-offs are not explicitly presented.

17. Leigh Short (Chem. Eng. Dept.) Since New England oil would be as sour as Arabian oil, SO_2 pollution would be the same as present levels.

    The impact of discovering a complete gas field, which would not be detectable seismically, should be considered.

    Cumulatively there may be more oil spilled by the large number of smaller handling operations than occurs with larger handling operations (except in a catastrophic accident). This has not been actually addressed in the document. Although a pipeline or tanker break is clearly worse, smaller handling spills are more difficult to control or eliminate.

    On p. 262, in 2nd paragraph, the argument is superficial.

    Gulf coast data on hurricanes and its relation to oil spills has no relation to long-term oil spills.

18. Henry Schwartzberg (Ag. & Food Eng. Dept.) There is no estimation of the frequency of spills, wind patterns and where and how far the oil from spills might travel. If the facts do not exist, what is the time scale necessary for obtaining them?

19. John Zahradnik (Mech. & Aero. Eng. Dept.) The impact on the Massachusetts public subsistence shellfisher would be considered.

20. Paul Godfrey (Botany Dept.) The long-term costs of cleaning up large versus small oil spills should be considered.

IV. Mitigating Measures Included in the Proposed Action

21. Henry Schwartzberg (Ag. & Food Eng. Dept.) The frequency of overflights by the coastguard and USGS for monitoring of oil spills should be increased for better inspection and surveillance. One per day in New York harbor is less than would be good to identify an oil spill source.

    The discharge of drilling cuttings should not be done at fisheries sites.

    There is not enough experience to make rate of failure predictions.

22. Paul Godfrey (Botany Dept.) Since ecological dynamics vary greatly in different regions, there is justification for a regional-level EIS.

23. Leigh Short (Chem. Eng. Dept.) Will there be new refineries constructed onshore or existing ones used? Will there be any offshore tankerage loading from rigs? The efficiency of the pumping field depends on substrate and sand. To start and shut down the pumping operations is hard. A gas-driven field is not as bad.

    There should be many more mitigating measures discussed. There should also be a section on technical jumps to deal with different environmental challenges, i.e., the big jump between Gulf of Mexico and North Sea technology. Would this be needed or would it occur here in New England?

    There is much variation in company standards for rig operation and operator training. An excellent operational crew is important.

24. Henry Schwartzberg (Ag. & Food Eng. Dept.) An incentive for compliance with quality operating procedures could be to regulate the ability to lease. It could depend on previous compliance and procedural quality by the operators.

25. Richard Smardon (EOEA) Will the state be able to have some jurisdiction in these matters? That is, will appropriate state agencies be able to comment on draft federal operating order?

26. Henry Schwartzberg (Ag. & Food Eng. Dept.) Will the jurisdiction cover inspection, surveillance and/or enforcement?

VI. Relationship Between Local Short - Term Use and Maintenance and Enhancement of Long - Term Productivity

27. Arthur Wright (Economics Dept.) Scope of report reflects deficiency of U.S. energy policy. Opportunity costs are only discussed briefly. Some of the arguments are imprecise. A discussion of the price impacts on the region has been omitted. The New England oil would have no impact on the cost of oil in this area but if gas were discovered, New England would definitely benefit. The issue of royalties has not been discussed.

VIII. Alternatives to the Proposed Action

F. Energy Alternatives

28. Lawrence Ambs (Mech. & Aero. Eng. Dept.) The discussion assumes growth orientation but the country is in a strong changing state now. The various alternatives are adequately discussed but do not consider a national energy policy. What are we going to actually do and how -- policy is needed.

G. Alternative OCS Exploratory Programs

29. Arthur Wright (Economics Dept.) The discussion of the bidding processes is shallow and should be more inclusive. All of the reasonable alternatives to bidding processes have been considered but not in adequate depth.

    The benefits from the separation of exploration from exploitation should be included.

30. Henry Schwartzberg (Ag. & Food Eng. Dept.) Perhaps exploratory drilling should be initiated by U.S. government-financed private contractor. The data could then be used to make a more rational decision later.

31. Ervin Zube (IME) Lesser magnitudes of leasing should be discussed in more detail than the present two and a half paragraphs. Alternatives should be considered in greater detail especially in consideration of tradeoffs between potential impacts and possible mitigation measures.

Addendum

Additional Comments

REMARKS ON THE O.C.S. DRAFT ENVIRONMENTAL STATEMENT

Gregory W. Webb
Dept. of Geology and Geography

The description of the geology of the offshore environme (Section II A1a, pp. 173-206) is adequate and is based upon the best available published data; further detail could be developed, at this time, only by use of proprietary reflection seismic data. Refinement of estimates of hydrocarbon potential are meaningless prior to extensive drilling, other than to observe that the similarity between the eastern U.S. offshore and the adjacent Canadian offshore does not imply the presence of vast reserves off the U.S. Nearly 100 holes have been drilled off Canada without any large discoveries.

The depths of the Georges Bank and Baltimore Canyon Troughs, or basins, is shown correctly as being in the 2500 to 3500 foot range, as on p. 199, correcting older and shallower interpretations used in Maher, 1971, U.S.G.S. Prof. Paper 659. Thus, it correctly assesses the large volume of sediments present offshore and the great depth of wells which might be drilled.

The section on geologic hazards, p. 206, is too brief, though not misleading. The continental shelf surface is not susceptible to submarine landslides, even during earthquakes, assuming that drilling and production platforms are properly emplaced. Such emplacement also should preclude failure due to undercutting by current scour. Structures developed on the continental slope would, however, be susceptible to slope failure and sliding, and if located in very deep water (several thousand feet and deeper) they could be impacted by catastrophic turbidity currents. Pipelines across the continental shelf and onshore would be safe from even major earthquakes, if experience in California is any guide.

The Tehachapi earthquake of 1952, 7.6 Richter and VII to XI Mercalli, with the epicenter in one oil field and the fault trace straddled by others, caused no pipeline failure and no spills at the many hundreds of drilling or producing wells in the area; some wells suffered bent and pinched casings, in one field. By contrast, other damage was extensive, including the explosion of a gas recycling plant (a refinery-type installation), widespread damage and collapse of buildings, road cuts, railroad tunnels, water pipes, pole-mounted transformers, etc. It is evident that offshore equipment designed to withstand offshore hurricanes will withstand major earthquakes. The real risk from major earthquakes is to the present tank farms at dockside in Boston Harbor and to future tank farms and refineries onshore, as well as to Boston and similar older cities in which most buildings are of unreinforced masonry and brick construction, demonstrably earthquake damage prone.

The coastal zone geology is less well described, particularly as to the dynamics of coastal zone processes and changes of beach and channel configurations. No drilling is at all likely in the coastal zone in New England, but pipeline construction to the interior from offshore might pose problems. Ditching and burial would entail some temporary washing of spoil sediment as well as the disruption of the narrow construction zone itself. Extra care would be required also as to the location of a pipeline crossing, since the intensity of both the tidal currents and the surf is greater on the New England Coast than on the Gulf Coast. Our conditions are more like those of the North Sea, and it would be useful to know more concerning construction practices used today in that area.

REMARKS ON THE O.C.S. DRAFT ENVIRONMENTAL STATEMENT

Paul J. Godfrey
Department of Botany
Melinda M. Godfrey
Research Assistant
Institute for Man and Environment

Page 562:

There are a lot more than ten brown and nine red species of algae on the Atlantic coast north of Cape Cod.

(2) Submerged Sea rasses: We question the statement, "Zostera represents a warm season species and is replaced in cooler seasons by Halodule beaudittei." Zostera goes north to the Arctic and south to North Carolina; North Carolina is the northern limit of Halodule. In other words, they barely overlap. Zostera is a perennial growing in dense beds; it grows in the spring until the water temperature reaches about 20°C, and then undergoes fragmentation and decay in the warm weather of summer. In the winter it lies more or less dormant until the next spring's growing season, but we have never heard of its being seasonally replaced by anything.

Page 563 (3):

Mangroves are not found north of Florida.

Comments on the Effects of Oil on Marine Organisms:

The long-term adverse effects of oil in the marine environment may have been downplayed. Many more studies indicating the adverse effects could have been cited. There was only brief mention of the concern many feel that small, chronic spillage may be more harmful than one massive spill. Hydrocarbons are a persistent poison to most marine organisms.

The report points out that oil causes "stress and mortality" to phytoplankton. If phytoplankton photosynthesis is seriously disrupted, nearly everything else in the ocean will suffer, including fishery organisms. Unfortunately, most oil is spilled in inshore waters where most of the productivity takes place. If phytoplankton is substantially interferred with we really don't have to worry about whether oil damages other organisms directly.

Studies from Louisiana are cited to show that marine life can continue to function in the presence of oil. It should be remembered that New England waters are much colder and processes of weathering and bacterial degradation are much slower.

It is being shown more and more that small quantities of oil can create subtle but significant disruptions in marine animals. To cite just one recent example, Atena and Stein (Environmental Pollution, vol. 6, pp. 77-86, 1974) have demonstrated that just a low level of hydrocarbons in the water can jam the sensory apparatus of lobsters and keep them from feeding.

SECTION C

Page 564:

(4) Rocky Sea Fronts: This section is very generalized and weak. It does not go into any detail about the importance of this habitat in the New England region, and the Canadian Maritimes. It fails to cite a recent paper by Mann (Science 182:463-498, 1973) pointing out the very high productivity of seaweeds on rocky shores, particularly during the cooler periods of the year.

(6) Barrier Beaches: This section is very poor since a tremendous coastal region has been reduced to only one type of model. It does not differentiate between northern and southern beaches, but lumps them all together.

Page 566:

The paragraph that discusses man's effects is in error (this is a subject that we have studied and published on). The efforts at stablization have not resulted in erosion of the beach and foredune system. This implies that all erosion is the result of man - ridiculous. Stabilization has lead to some problems in a few places, but not as implied in this statement. The comment about stabilization resulting in a typical dune community they describe is absurd! Dune zonation is the result of natural processes - particularly salt spray, flooding, and sand movement.

The description of barrier island vegetation (apparently taken from one of our papers) only applies, in part, to the southeastern U.S. coast. They completely disregard the type of coastal features of New England and the Northeast. Likewise, no mention is made of the heavily vegetated sea islands of the Georgia-South Carolina coast. The listing of species includes purely southern trees, such as Pinus caribaea, with no mention of dominant types beyond the south coast.

Page 568:

The first sentence is a gross exaggeration - "Storm generated waves have breached the barrier island system repeatedly..." While true for certain sections at times of severe storms, and only a few regions during moderate storms, that statement does not hold for all the east coast barriers. Extensive areas have never been breached in recent times.

The statement that "the above description holds for the entire Atlantic coastline where barrier beaches occur" is ABSOLUTELY UNTRUE! The description given only holds for certain portions, mainly southern of the Atlantic coast, and then they ignored major variations.

Page 569:

The figure used as a typical zonation pattern for a barrier island (Figure 108) on page 569 was taken from one of our papers on the ecology of Core Banks in North Carolina and cited by the VIMS group. The diagram as reproduced is incorrect and does not show what we described. Besides, it does not even suggest that this diagram only applies to a certain portion of the North Carolina coastline where barrier islands are under severe stress from storms and rising sea level. Many sections of even the Carolina coast are quite different having high dunes and well-developed forests.

Nowhere is any mention made of the differences between high and low energy shorelines along the Atlantic Coast. Such differences are extremely important in the general ecology and geology of the barrier islands, and likewise would be for oil spills.

Page 574:

(10) Salt Ponds: The first sentence is in error and the writer seems to have mixed salt ponds with lagoons. Salt ponds, or pannes, occur in salt marshes and are not shallow "embayments." The definition given in the first sentence applies to the large lagoons (or sounds) behind barrier islands.

Summary:

In general, the biological sections are poorly done with gross errors, especially in the botanical sections. Certain portions are correct for some areas of the coast, but they CANNOT be applied as broadly as this statement implies they can. The lumping of the great variety of ecological patterns and vegetation types on the Atlantic Coast into one description taken from a very specific part of the coast is highly erroneous (even though they did take information from some of our research). The report should have an inventory of the marshlands and coastline that would be affected by oil problems.

SECTION E
Page 190:

The effects of oil are greatly understated. Line 13 should read "introduction of petroleum into the ecosystem does create disturbances (not "may"). There is also a great deal of data now accumulating which deals with the effects of petroleum and it is conclusive - not "far from conclusive" as they say.

Page 191:

The discussion about sandy beaches is wholly inadequate! Their resource value is much more than the "recreational value" that the report implies. To downgrade the biological community of sand beaches, as they have, is a gross distortion. Work done on southern sand beaches (Pearse, Humm and Warton 1942) has shown that a great deal of biogeochemical cycling goes on in the sand as a result of the vast quantities of bacteria in the beach. The sand beach has a rich array of micro-organisms, both plant and animal, that make up a significant ecosystem. While this community becomes somewhat reduced in the north, it does exist. There is also a fair degree of primary productivity within the sand beach, although its nutrient cycling function is greater. They totally disregard the role of sand beaches in the lives of shorebirds, and this role is one of the most important aspects of the coastal environment, and one of the most affected by oil spills.

Page 199: (Wetlands)

This section has been treated better than others, although it is lacking in depth. A major omission in this discussion, and one that has been discussed in several research reports, is that of accumulation of petroleum derivatives once they have been carried out of the marsh and into the estuarine food web. It is true that the marsh grasses can recover from a spill after a period of time, but the material that was coated is carried out of the marsh and into the complex detritus food web of the estuary. It is in this web that the greatest damage occurs to the system, and has the most long-lasting effects.

NEW ENGLAND REGIONAL COMMISSION
53 STATE STREET
BOSTON, MASSACHUSETTS 02109

MEMORANDUM November 21, 1974

(for Staff Purposes)

FROM: Arnold R. Wallenstein Esq.

SUBJECT: Re: Comments on Draft Environmental Statement of the United States Department of the Interior DES 74-90, On the Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf.

Within this memo I will identify nine major issues that are either highlighted or omitted from discussion within the Draft Environmental Statement and which are crucial to Outer Continental Shelf Leasing Policy. I have not only commented on policy, but I have also looked for inadequacies within the Statement that could serve as a basis for a legal challenge for failure to meet the requirements of the National Environmental Policy Act.

I. THE DRAFT ENVIRONMENTAL STATEMENT IS INADEQUATE AS IT CONTAINS NO DISCUSSION OF THE EXTENT OF TIME THAT OIL AND GAS FROM THE OUTER CONTINENTAL SHELF WILL BE PRODUCED.

Pursuant to recent court decisions, an environmental statement can be attacked and sent back to the agency for further facts if there is not sufficient information upon which a decision maker can make a sound decision. This statement can be attacked in this manner, as no where in the statement is there any discussion concerning the length of time the U. S. can expect to rely on the O.C.S. for oil and gas. This is crucial management information; if the O.C.S. can supply the country with oil and gas for, perhaps a hundred years, then one can base a long term energy policy upon this information. But if the oil and gas is only expected to last for, perhaps, only a few years (as the Alaskan North Slope Case) then one cannot found a long term energy policy upon these resources. A lack of such supply forecasts could be termed an inadequacy in this statement.

There is within the statement statistics as to the amount of oil and gas that might be present under the O.C.S. (I, P. 168), and estimates of daily offshore production. (II, P. 224, 228-230). From these sets of figures I have made my own very rough calculations of the number of years we can expect to receive oil from the O.C.S. From the Atlantic O.C.S., at estimated 1985 barrel per day production, the lowest reserves case would give us 9.6 years of production from this area; the high reserves case would give us 19.2 years of production. At the year 2000 barrel per day production rate, in the low reserve case we could expect only 5.3 years of oil, and in the high reserve case we could expect 10.7 years of production from the Atlantic O.C.S

As for natural gas, at the year 2000 expected production rate in the low reserve case we could expect 13.9 years, and in the high case 27.9 years of gas production from the Atlantic O.C.S.

Five years of oil and 14 years of gas at the year 2000 production level with the low case of reserves is a rather short period to base a long range energy policy upon. It is this type of information that decision makers as well as the public would like to be aware of beforecommitting their Outer Continental Shelf resources to what may be irreversible resource depletion and environmental degradation. Therefore more accurate estimates of expected years of production should be produced by the Department of the Interior before this Draft Environmental Statement can be considered legally adequate.

II. THE DRAFT ENVIRONMENTAL STATEMENT IS INADEQUATE AS IT CONTAINS NO DISCUSSION OF THE AMOUNT OF O.C.S. OIL AND GAS NEW ENGLAND WILL RECEIVE OR OF THE IMPACT ON OIL PRICES IN NEW ENGLAND FROM THE INTRODUCTION OF THESE NEW RESOURCES.

Another crucial bit of information that decision makers and the public need to know is how much of the O.C.S. oil and gas will New England actually receive. The statement contains no regional projections of these amounts, nor does it discuss where it expects the crude oil to be refined and thereafter distributed. The statement does not discuss what would happen if a refinery were built in the New England area, and in fact it dismisses the possibility of a refinery in New England (II, 322).

If none of the oil will initially be transported into New England then it is very possible that New England will bear many of the burdens from O.C.S. development, yet receive little benefit in terms of increased supply of oil and gas. If this should be the case, then this type of decision making information should be clearly noted in the statement, as it will probably be a crucial factor in any decision on whether a development should continue - at least on the state and regional level.

Moreover, there is no discussion of the effects of O.C.S. oil on New England oil prices. If there will be no lowering of petroleum prices to New England consumers even after O.C.S. development, as has been described as a possibility in[4] study by New England Regional Commission on the Effects of O.C.S. Development on New England Oil Prices, then this will be another crucial piece of management information that should be stated.

Therefore, without this decision making and management information on whether New England will receive any of the O.C.S. oil, and its price effects, the statement can be considered inadequate and should be redrafted to include such information.

III. THE DRAFT ENVIRONMENTAL STATEMENT IS INADEQUATE AS IT DOES NOT WEIGH OR BALANCE THE IMPACT OF O.C.S. DEVELOPMENT ON MARINE FOOD RESOURCES AGAINST THE NEED FOR ENERGY RESOURCES FROM THIS AREA.

a. The impact on marine resources is quite important information, for in these days of world food shortages and potential mass starvation, the Outer Continental Shelf can represent a very rich world food resource, for both fish and aquaculture. The statement clearly shows that these marine resources are threatened by large scale O.C.S. oil and gas development, but no where is the question of whether the O.C.S. can remain both an energy and food resource discussed. This is one of the most important questions that must be answered before the O.C.S. is developed, yet nowhere in the statement are these two questions analyzed against each other in the same section.

The draft statement shows that oil spills can be lethal to the lower plankton organisms, although the evidence at this point is not conclusive. There is also some evidence of the toxic effects of oil spills on the Nekton (active swimmers), for many dead fish have been found in the vicinity of oil spills, and alteration of behaviour patterns has also been discerned. (II, 175). Oil has been shown to be lethal to the benthos (bottom dwellers); these creatures are even more greatly affec by drilling and pipelaying operations which directly impact their living area and cause them to be smothered by large amounts of sediments, drill cuttings and toxic drilling compounds, (II, 175-180).

If the water column is filled with drilling rigs, oil leakage and spills, ships drill cuttings, and sediments, then the area will be entirely unusable for aquacultu which is a potential method for farming the sea.

The statement specifically discusses the impact of O.C.S. development on commercial fisheries. At one point, it states that "Oil spills present the greatest potential hazard to commercial fish and shell-fish. Fish kills have been documented in several areas of major spills of refined oil." (II, 268.). Moreover, it is stated that oil pollution may introduce carcinogenic hydrocarbons into the aquatic environment which may in turn be concentrated within the bodies of commercial fish and shell-fish, so as to become unfit for human consumption. (II, 167-169, 267-268).

In addition to the direct toxic effects of oil spillage on fish, O.C.S. development will remove at least 8000 acres of the sea bed and water column from commercia fishing by virtue of physical obstruction. Finally, fish that are merely contaminat by oil, and sites suitable for aquaculture, will also be removed from food resource b by oil spillage. (II, 269-275).

Oil spills can also have lethal effects on estuaries, bays and wetlands, which are among the most productive areas in the world, and provide the food and breeding grounds for many species of marine life. Thus, destruction of wetlands and estuaries by direct development or indirect oil spillage can have devastating effects on the food chains and ultimately upon the marine resources that humans can rely upon for food, now and in the future. (II, 191-203).

It is expected that hundreds of thousands of barrels of oil and toxic drilling compounds will be released over the life span of O.C.S. production into the ocean, destroying fish and poisoning the fish-to-human food chain. (II, 304-307, 311). It is thus highly probable that the use of the O.C.S. as a marine food resource will be significantly impaired.

Therefore, since the facts are not conclusive, it is recommended that more study is needed until we can be sure of the real effects of O.C.S. development upon marine food resources. This is a significant and possibly irreversible decision to take action which could reduce marine food resources and condemn millions of people to starvation around the world. At least until we are sure that the impact on these resources will not be absolutely fatal, O.C.S. development should not go forth until these questions have been examined with accurate and determinative information, and until a clear decision has been made on the ability of the O.C.S. to be used for both a marine food resource and an energy resource.

b.The draft statement also does not state that fish use less man-made energy to become food than it takes to produce crops or raise cattle. No where, however, is the overall food-energy balance considered in this statement. Perhaps if the O.C.S. were to be used exclusively for food resources, one might find that we save much more energy by not growing the equivalent amount of protein on land. However, this issue is not discussed in the draft statement, and thus could be considered inadequate until the overall fish-energy and energy balance questions are faced.

IV. THE DRAFT ENVIRONMENTAL STATEMENT REVEALS A BADLY CONSIDERED, PREMATURE AND ILL-DEFINED ENERGY POLICY.

A reading of the draft statement reveals that there is no comprehensive national energy policy in which O.C.S. development can be put into perspective. Unless decision makers are able to weigh O.C.S. development against the full impact of an overall energy policy, they cannot adequately assess the true environmental, socio-economic and energy impact of this policy.

a. As noted above, in section I, the statement does not consider any projections of how long we can expect oil and gas from the O.C.S. An overall energy policy should not be based upon O.C.S. petroleum resources until it is known whether the resources will be available in the long term or the short term.

b. Further inadequacies with this statement are found in the section on irreversible and irretrievable commitment of resources, (II, 321-323), where it is therein stated that if we develop the areas of the O.C.S. with the highest potential oil reserves, then we may delay development of secondary and tertiary petroleum recovery technology. However, it is not stated that if we use these O.C.S. resources then we will also delay commercial development of other alternative types of energy resour and also have depleted our last major easily available reserves of petroleum in this country. We will have then consumed much of our new petroleum resources and be left with no alternati recovery technologies, no well developed alternative energy resources, and no major emergency petroleum reserve.

An alternative policy may be to use in the short term demand reduction policies, and place a high priority on developing other alternative energy resources, and therefore save the O.C.S. oil for other uses. Such other uses would include the manufacturing of petroleum based goods, such as drugs, chemicals, plastics, synthetic rubber and clothing fibers that cannot be replaced by other materials, and will be lost if the oil is burned; also we could save the O.C.S. resources as a national strategic energy reserve for use in times of emergency, or in the failure of other energy resour

The point is however, that this type of alternative policy was not considered in this statement, yet it is absolutely essential to do so if this country is to have a sound and reasonable energy policy for the future.

c. Further evidence as to the inadequacy of the discussion of energy policy in this statement is found in the section on Energy Alternatives. (II, 347-412). Therein all energy alternatives are described, but again good decision information is lacking: Each energy alternative is not considered specifically relative to O.C.S. leasing. For example, could the particular energy alternative, if developed, replace O.C.S. oil? How long will each alternative last in years relative to O.C.S. oil? Would it be better to use one or all of these alternatives in the short term, and save O.C.S, as a long term reserve? Moreover, the relative environmental impacts of these alternatives vis-a-vis O.C.S. oil are not compared.

Further, the energy efficiences of these relative alternatives are not compared. How many tons of western coal would be needed to match O.C.S. oil output and BTU's? How many homes would have to be solar heated to replace O.C.S. oil, etc.? Thus, the section can be described an inadequate as the alternatives are not presented in a form that really aids the decision maker in assessing the costs and the benefits of the possible alternative energy policies.

V. THE DRAFT ENVIRONMENTAL STATEMENT REVEALS ADVERSE ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS TO SUCH A GREAT EXTENT THAT THE BURDENS OF O.C.S. DEVELOPMENT IN THE PRESENT TIME FRAME MAY NOT BE WORTH THE BENEFITS.

The statement clearly points out that the environmental impacts are potentially very great. Section III, above, discussed the off-shore impacts on the marine environment. (II, 162-216).

a. Air quality will be adversely affected by evaporation from oil spills, well-fires and escape of natural gas. (II, 261). However, greater degradation of air quality could arise from new refineries and related petro-chemical industries built to handle O.C.S. development. The statement notes that an increase in refine capacity will add to the total emissions of nitrogen oxide, suphur dioxide, hydrocarbons, carbon monoxide and hydrogen sulphide.

The statement is inadequate in this area however, because it does not note tha studies have shown that there have been increases in lung cancer and respiratory diseases in areas that are situated near refineries and petro-chemical industries. This is essential decision making information which is not brought out. (C.F. II, 262, 309).

b. Development of O.C.S. will have great impacts on water quality. This statement notes that thousands of barrels of drill cuttings, hundreds of thousands of barrels of toxic oil and formation waters via spill and leakage will be emitted into the water over the course of O.C.S. development. This pollution of the water will of course have the greatest effects on marine resources, which was discussed above in section III. Moreover, such pollution of the water will lessen the value of the oceans for sport fisheries, recreational and swimming uses. (II, 262-265, 307 a-b, 310).

c. The statement goes into great detail on the adverse impacts on beach and shore line recreation, asthetic and scenic values, historical or archaeological sites, con servation resources, and sport fishing. Most of these impacts are described as adverse and unavoidable and irreversible. (II, 214-218, 255-259, 313-316.)

d. The economic and social impacts of O.C.S. developmemt are also demonstrated to be quite significant. (II, 242-249). However, the statement can be attacked in thi area as it does not show the net impact of whether the increase in services which will be required of affected municipalities would outweigh the benefits of increased employment and tax revenues. ie.. will burdens outweigh the benefits?

e. The study reveals that a large amount of land will be needed for refineries, co struction of petro-chemical industry and for the use of other related industries, su as, drill-rig and pipe assembly, and construction materials and services that are required for an infra-structure capability to sustain O.C.S. production. In eastern Mass. and R.I., O.C.S. development will require 17% of the undeveloped land actually suitable for primary development, without considering the amount of land needed for secondary related industries. A commitment to use this amount of land and to undergo consequent environmental impacts will have significant ramifications for the affected area, and should not be taken without sufficient study and policy consideration.

f. Finally, we come to the question of how much development can the environment sustain, and still support human life? O.C.S. development will place new burdens on our already stressed environment - but in response to this the draft statement can only note that the additional stress which the eco-system can absorb is limited, and at present the bounds of the limitations are not known (II, 318). But shouldn't we want to know the perimeters of environmental capability before massive O.C.S. development commences? Therefore, because this long term limitation is not known and is not discussed in the draft environmental statement, the statement can be considered inadequate and subject to attack for failure to consider this point. It may be wise to postpone O.C.S. development until the outward bounds such impacts are known.

VI. THE DRAFT ENVIRONMENTAL STATEMENT IS INADEQUATE AS IT DOES NOT SUFFICIENTLY CONSIDER THE EFFECTS OF O.C.S. DEVELOPMENT ON THE PUBLIC HEALTH.

The draft statement identifies many new sources of air pollution resulting from O.C.S. development such as, natural gas leaks, gas well blowouts, well-fires and a large amount of evaporation of hydro carbons. (II, 260, 262, 309). However, one of the main new sources of air pollution that has not been adequately considered is that which would result from construction of refineries and petro-chemical industries in coastal areas adjacent to O.C.S. development.

Studies have shown that the incidence of lung cancer and respiratory diseases is significantly higher in communities adjacent to refineries and petro-chemical industries. Since one could expect such industries to be developed in response to O.C.S. development, then these potential public health impacts should be described. The fact that a community may absorb higher rates of cancer and lung disease some years after O.C.S. leasing begins is certainly an important piece of management information that the decision maker and the public should know.

The draft statement also clearly points out that water pollution would significantly increase through spillage of thousands of barrels of toxic oil and drilling compounds from routine drilling operations, as well as from accidental spillage, pipe-line laying operations, and associated on-shore pollution. (II, 262-265, 307 a-b). However, the study does not point out in the section on water pollution that oil pollution from any source may introduce carcinogenic (cancer causing) hydrocarbons into the aquatic environment. These cancer producing substances, can be concentrated within the bodies of commercial fish and shell-fish and move up the food chain until they reach species which are used for human consumption. This fact is alluded to in II, 267-268, but studies at this point are not definite upon the extent and implications of this contamination of food chain. This information of course, is important to the decision maker in deciding whether the benefits of O.C.S. development are worth the burdens placed upon the public health of the community.

In the section on Energy Alternatives, the draft statement also inadequately discusses the effect on the public health by nuclear power plants by failing to discuss nuclear power plant safety issues, long term storage of plutonium, and the danger of liquid metal fast breeder reactors. Also, the potential public health impact of the burning of coal in urban areas, especially the increased incidence of heart and lung diseases as well as cancer. Finally, the statement inadequately discusses the dangers of geothermal energy such as its potential for causing earthquakes in the immediate area.

In sum, draft statement can be considered to have inadequately discussed the public health issue as it does not consider the impact on air quality and public health from the development of a refinery and a petro-chemical industry; the impact on water quality and the public health by the contamination of the marine food chain and its potential carcinogenic effects; and finally, the public health dangers of other alternative sources of energy.

VII. IF THE OUTER CONTINENTAL SHELF IS DEVELOPED, THEN ALTERNATIVE SHORT TERM POLICIES SHOULD BE FOLLOWED.

The present Department of the Interior policy in regards to O.C.S. development calls for the immediate leasing of at least ten million acres of O.C.S. for oil and gas leasing, despite the lack of information as to how long O.C.S. oil and gas will last, as to how much oil and gas New England would get, as to the public health and environmental impacts, and without a coherent and unified national energy policy in light of which O.C.S. development can be rationally compared and considered. It may be asked however, why this country should rush to develop and consume one of its last great petroleum reserves with such significant irreversible consequences, without proper consideration of the questions asked above?

Perhaps a better alternative policy than the one the Department of Interior is rushing into is that which is partly identified on II, 338-342. Such an alternative policy would postpone the increase in O.C.S. development until proper pollution control technology, base-line information environmental studies, land-use plans, and regulations are passed which can allow O.C.S. development to proceed with greater benefit and fewer adverse consequences to the people of the affected areas. More importantly however, this country should not develop O.C.S. reserves until it has considered whether the O.C.S. should be developed in light of the food problem the world currently faces, in light of the specific New England impacts of such development, and in light of a better considered national energy policy. Once these long term policy questions are settled, and once the short term questions have been dealt with, then O.C.S. development, if deemed the best policy, could commence, but with fewer adverse impacts and much greater agreement over its wisdom and benefits.

Therefore, it is recommended that O.C.S. development should be postponed until such time as these short and long term policy issues and technical questions are settled. This postponement may only last two years, (c.f. II, 343), but it is a period that prudence and wise policy making indicates to be the best course of action.

VIII. THE ACCELERATION OF THE O.C.S. LEASING IS PREMATURE AT THIS TIME AS THERE HAS BEEN INSUFFICIENT LONG TERM PLANNING AND PREPARATION, AND INADEQUATE INPUT FROM LOCAL DECISION MAKING BODIES.

The study states (II, 319) that cumulative impacts of O.C.S. development can be controlled through proper planning and coordination among federal, state and local governments, and private industry -- but has this actually occurred?

For example, the Coastal Zone Management Act was enacted to control on-shore effects of coastal development, but the Department of the Interior has publically stated that it will not wait for Coastal Zone Management programs to be developed before O.C.S. leasing progresses. Even though the draft statement highlights the great on-shore impacts of O.C.S. development, the Department of the Interior is willing to allow these impacts to occur before states have developed their Coastal Zone Management programs.

The Federal government has shown no intention of sharing decision-making and policy shaping power with the states, local government, or the public at large. (c.f. The U.S. vs. Maine Case where the Federal government has gone to the Supreme Court to protect its exclusive rights to control off-shore O.C.S. jurisdiction and consequent development.)

Thus, the indication in the draft statement that cumulative impact of O.C.S. development can be controlled through cooperative federal, state and local planning is a myth designed to weaken the opposition of the states towards this leasing program.

Therefore, until the Federal government takes positive steps to join with the states and the public at-large in making decisions on the timing and the extent of O.C.S. oil and gas development, the states should exert every means within their control to enforce their rights to protect the public health of its citizens, the environment, and the livability and the economy of the state. The ultimate goal is for the states to have an effective voice in the initial policy decision and in subsequent developments that emanate from the leasing of the Continental Shelf in the waters adjacent to their coast lines.

IX. IF THE PROGRAM TO INCREASE THE ACREAGE OF OUTER CONTINENTAL SHELF LEASING IS ADOPTED, THEN THE ADEQUACY OF THE MITIGATING MEASURES CAN BE QUESTIONED.

The draft statement describes the mitigating measures (II, 287-303) that would be included in the proposed actions. These measures include geophysical exploration, exploration drilling, regulation of field development (drilling, platforms, completion, sub-sea issues), the transportation of oil and gas (pipe-lines, tankers and barge s), off-shore oil storage, on-shore treating and storage facilities, management techniques, research on advanced technology, and conservation practices. It may be questioned whether mitigating measures therein proposed are the best practicable that can be undertaken to insure that the adverse impacts to the environment, the economy, and the marine food and energy resources are minimized.

(Writer's note -- this section should be developed in greater detail by those persons with expertise in the above mentioned areas to assure that the states can put forth those mitigating measures which they feel will protect to the greatest extent the interest of the state and its citizens.)

The Commonwealth of Massachusetts
Department of Natural Resources
Division of Marine Fisheries
Leverett Saltonstall Building, Government Center
100 Cambridge Street, Boston 02202

February 3, 1975

MEMORANDUM TO: Frank Grice, Director

FROM: W. Leigh Bridges, Assistant Director

SUBJECT: Draft Environmental Impact Statement, 74-90, on the Proposed Increase in Acreage for Oil and Gas Leasing on the Outer Continental Shelf, Prepared by the Bureau of Land Management, U. S. Department of Interior

The above-titled document describes in a general way the environmental impact on the proposed leasing of 10 million acres of outer continental shelf lands for oil and gas leasing. The scope of this leasing includes areas on the Atlantic Coast, Gulf Coast and Pacific Coast, and attempts to summarize the impacts on the resources in these areas. More definitive impact statements will be produced on the effects of exploration, development, and transportation of oil and gas as these areas are leased and developed. The following is a list of specific comments:

1. Volume 1, Page 98, Section h, discusses contingency plans and equipment for controlling and removing pollution. It is noted that standby pollution control equipment will be immediately available at a land-based location. The use of pollution control equipment for effective control of offshore oil spills is questioned. Since this equipment will be land-based and will be located as much as 20 to 100 miles from

the nearest platform, it is difficult to envision effective deployment of equipment in a timely manner to prevent the spread of spills in offshore areas.

2. Pages 100 through 102, Section b, on-site inspection: this section does not contain enough information to give the reader an overall idea of the effectiveness of the inspection program. The frequency of inspection is questioned, since it would appear that producing wells are only inspected once a year. Similarly, the content of these inspections is not clearly defined.

3. On Page 106, the value of fines for failure to install subsurface safety devices in 1970 in the Gulf of Mexico is presented. It would be more appropriate to present several years' data on the number of fines, warnings and suspensions so that the reader could gain some insight as to whether the inspection and enforcement program is effectively reducing the numbers of spills and other operational failures.

4. On Page 115a, it is noted that the Corps of Engineers requires that pipelines crossing shipping fairways be buried to a depth of 10 feet. In order to reasonably protect fishing operations in areas where pipelines may conflict with trawling, it is suggested that the States and the National Marine Fisheries Service require a similar pipeline burial policy.

5. On Page 117 (c), the report indicates that NOAA is conducting environmental baseline studies sponsored by the BLM in the Gulf of Alaska. Because of the expertise of the NMFS in the North Atlantic area, and in particular the Georges Bank area, with respect to stock assessment programs, it is suggested that the BLM contract environmental assessment studies to the NMFS for the North Atlantic area. Background information, already available, in the NMFS will be valuable for any rational assessment of the environmental impact oil development in this area. It is also suggested that the several States' fishery agencies be represented in determining and reviewing the content of these studies. Such a program has already been suggested by the State fishery directors and that these studies should begin immediately.

6. On Page 126, it is noted that each coastal State is requested to have membership on the OCS Research Management Fishery Board. It would appear that Massachusetts would have a considerable stake in representation on this board when studies begin in the North Atlantic area. It is noted that fisheries interest should be required of the State Representative.

7. On Pages 129 and 130, the report summarizes present studies being conducted by the BLM in the Atlantic area. No mention is made of whether or not future stock assessment and ichthyoplankton studies will be conducted. Such studies are of paramount importance to any realistic impact assessment on the fisheries, particularly for the Georges Bank area which has in the past produced approximately 12% of the world's fish production. It would appear that to date the BLM has bypassed to a large extent, the Federal agency (NMFS) which has the most expertise for conducting these kinds of assessments.

8. On Page 211, it is noted that Boston has a higher frequency of reduced visibility than other areas in the North Atlantic due to fog and haze. The importance of the fact of this reduced visibility would appear to have a large bearing on the operation of oil production facilities in this area. Moreover, weather conditions would have a large impact on the proper spacing of platforms with respect to minimizing interference with fishing operations. It would appear that some information on this subject could be derived from experience in the North Sea.

9. On Page 253, fishery statistics would appear only to reflect domestic landings and values. Foreign fishery harvests must be included to reflect the true value of the fishery stocks of the Atlantic Coast.

10. Pages 663 to 675 discuss landings and values of commercial fisheries of the Atlantic Coast States. It is pointed out that, in particular, this presents a biased value of the stocks in the North Atlantic section. In the case of Maine, Massachusetts, and Connecticut, decreases in total pounds landed since the 1960's have been directly related to foreign fishing effort in offshore waters. Foreign fish harvests from the U. S. Atlantic Continental Shelf should be added to these landings and values reported. While foreign fish harvests are not reflected in the value of U. S. fisheries they should be reflected in the value of the fish stocks of the Atlantic Coast.

11. While the statistics reflect a realistic value for extractive industrie including fishing, they do not represent a true picture of the commercial stocks off the Atlantic Coast. A large increase in foreign fishin has effectively depressed the domestic values of these fisheries. The North Atlantic fleets have been reduced because of competition from foreign nations. A significant portion of the demand for fish in the U. S. is supplied through foreign imports. Domestic fishery landings and values could be expected to increase provided some management regim was adopted by the U. S. for these offshore waters.

12. On Page 681, Paragraph 2, the University of Rhode Island report is quoted. It indicates that fishing is projected to decrease in relative and possibly absolute importance. As noted above, domestic fisheries have declined and will continue to do so if management levels are not adopted for offshore loss. The present capacity demand in the U. S. for fish has increased from 11 to approximately 12 pounds per person. In addition, 70% of the demand in the U. S. is currently met by imports. If effective management were adopted, a large portion of this demand could be met from domestic sources.

The following comments pertain to Volume II of the Impact Statement concerning the Environmental Impact of the Action, Mitigating Measures Included in the Action, Unavoidable Adverse Environmental Effects, and Alternatives to the Proposed Action.

1. On Page 157, Section III, the report states the difficulty in quantifying the effects of large oil spills because of the scarcity of existing information on the environmental impact. It is pointed out that with the prior quantitative studies it is almost impossible to pretend this impact. Therefore baseline environmental studies are imperative prior to leasing exploratory drilling and production in the OCS.

2. On Page 169, Paragraph 2, the BLM concludes that sooner or later a major oil spill will occur wherever there is oil development. The BLM also concludes a rapid recovery of plankton populations affected by major spills. While this may hold true for many invertebrates, it is not the case with egg and larval fish forms and lobster larvae. It is quite possible that a large oil spill could effectively destroy a whole year class of fin fish or lobster in a particular area.

3. On Page 170 it is reported that formation water is treated to remove most of the entrained oil (not greater than 50 ppt average). This statement would appear to conflict with previous statements regarding discharges of formation water where all but 50 ppm is removed. This statement needs some clarification.

4. On Page 172, Paragraph 2, discussion of the impact of oil on meroplankt does not consider the effects on such benthic animals as lobsters which spawn only once every two years. The larval distribution is relatively unknown. However they are believed to concentrate at the surface. Therefore the impact could be considerable on offshore lobster populations. It should be noted on Pages 174 and 175 that during the West Falmouth oil spill in 1969 several hundred thousand fin fish were killed due to the direct toxic effects of No. 2 fuel oil. The kill involved approximately 25 species of fin fish.

5. On Page 185, Paragraph 2, it is noted that special stipulations can be attached to any lease sale to mitigate potential damage to a unique feature. It is questioned whether such mitigation can also be applied to living marine resources of significant commercial value. If this is the case, it should be the responsibility of the BLM to propose an effective system of mitigation in areas where spills will occur.

6. Pages 157 through 187 describe the impact of oil spills and contamination on various components of the biological communities in the offshore areas. Nowhere in this section is there any mention of the effects of oil spills on fish eggs and larvae or lobster larvae. However, great emphasis is placed on the short recovery period for the zooplankton and phytoplankton communities. This error of omission is inexcusable considering the importance of fisheries in the North Atlantic section. One would judge from this treatment that the BLM has written off any concern for fisheries stocks as they may be affected by oil development.

7. On Pages 192 and 193, it is again noted that substantial numbers of fin fish were killed in the West Falmouth oil spill. This was pointed out previously (Item 4) and should be reaffirmed in this section since mortalities involved much more than intertidal and beach fauna as noted.

8. On Page 267, Paragraph 1, it is noted by Hester (1974) that oil spills could possibly destroy a year class of clams or grunion. This citation appears to be one of the few references in the report which would indicate there is any possible effect or potential destruction of fish year classes. Again the report emphasizes the temporary reductions in plankton populations resulting from oil spill.

9. On Page 268, Paragraph 4, it is reported that the impact on bottom-livin species such as lobster and shrimp is likely to be very local because of the benthic habits of these animals. However, there is no indication that lobster larvae are associated with a surface film.

10. On Page 270, the report indicates that the relative spacing of oil platforms is important in considering the potential impact on commercial fishing activities. As a point of information, the report should indicate what spacing requirements or regulations have been adopted in the Gulf of Mexico to reduce this potential conflict.

11. On Page 271, Paragraph 1, it is indicated that pipeline corridors and burial out to the 200 foot depth interval reduces the hazard of obstruction conflict with trawling operations. Because trawling is so widespread on the North Atlantic shelf, the BLM should advance definitive proposals for minimizing this potential conflict. It is also noted that the traditional fishing grounds should not be pre-empted for exclusive use by oil developers.

12. Pages 266 through 273 deal with the effects on commercial fisheries. This section does not address the potential losses of ichthyoplankton and the resulting effects on successive year class stocks of fish. Much greater consideration of this impact is necessary in the report.

13. Pages 287 through 303, Section IV, discuss mitigating measures included in the proposed action. This section does not include any discussion or mention of direct monetary assessments against lessees for damage to living marine resources resulting from oil spills or other operating procedures. Some system of resource loss mitigation is needed and should not be omitted from the final statement.

14. On Page 328, Paragraph 2, it is noted that the Council on Environmental Quality ranks Georges Bank as one of the areas with the least environmental risk. It would be helpful to know the basis for this ranking and whether or not the effects of oil development on fishery production were included. More background information is clearly needed in this ranking of areas for environmental risk.

15. On Page 412, the alternatives of a Federal exploratory drilling program and a Federally conducted off structure stratigraphic drilling program are discussed. Both alternatives to the present system are dismissed with the indication that it would not be practical under existing manpower and budget constraints. Since these alternatives will be a significantly large Federal effort, the federal manpower and budget constraints are not a realistic limitation. It is pointed out that no new large Federal program has ever been established without a massive infusion of both money and manpower. The advantages of Federal exploratory drilling programs might outweigh the disadvantages when dealing with private oil developers.

16. Page 421 discusses a division of management and supervisory functions between agencies. Regardless of who has supervisory or management functions in the Federal establishment, the need for self-sufficiency of energy production will far outweigh any and all objections to OCS development whether real or imagined, since the value of living

resources will be of secondary or tertiary concern with any Federal supervisory or management agency. It is hoped, however, that suitable controls on production as well as leased areas can be initiated to provide maximum protection of living resources.

In conclusion, the Draft Environmental Statement does not provide sufficient information to evaluate the effects of OCS development on marine resources. No provisions are made to include values and landings of foreign nations of Atlantic Coast fish stocks occurring in the OCS. With the exception of one reference, there is no discussion, evaluation, or indeed an implication that major oil spills could significantly affect commercial fish stocks through the destruction of ichthyoplankton and lobster larvae. There is no attempt to suggest specific remedial measures to minimize conflicts between fishing and oil development operations, including trawling and platform spacing, as well as pipeline burial in the North Atlantic area. Potential exploration areas for development, as currently known, are not presented in sufficient detail to determine specific areas of possible conflict with fishing operations. With reference to the North Atlantic Coast, the traditional rights of fishermen to these areas may have historical legal implications which were not discussed in the report. Finally, the report emphatically states that oil spills in producing areas are inevitable, but there is no discussion or suggestion that some system of mitigation for damage to living resources should be developed.

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13 January 1975

Mr. J.W. Devanney III
Massachusetts Institute of Technology
Department of Ocean Engineering
Cambridge, MA 02139

Dear Mr. Devanney:

In response to your letter of 3 January, I have skimmed through the approximately 1200 pages of the Bureau of Land Management's Draft Environmental Statement. It is a compilation of generally available information brought together without analysis, an attempt to present data on the environment in an encyclopediac manner. It is too large to be considered "background" information for the layman, and too small to cover the problems that might result from offshore development in any specific locality. It's objective is ill defined.

For Massachusetts specifically it fails to point out that nowhere off that state is there any probability of oil ~~development~~ drilling within sight of shore. It does not point out the job benefits of ancillary industry to refining (such as petrochemical plants) to Massachusetts, nor does it show the far higher risk of coastal pollution from tanker importation than from pipelines from offshore oil fields. It fails to point out that fuel equalization costs to New England represent a cost to the rest of the nation that cannot be justified on the basis of New England states' opposition to development of oil off this coast.

The report is an amorphous product of anonymous authorship in a Federal bureau. The Massachusetts recipients, however, can hardly fault it, as Massachusetts itself has failed to produce any similar study more specifically oriented to its interests to the best of my knowledge. This in spite of the more than ten years that have elapsed since the oil potention of Georges Bank became widely known.

Sincerely,

K. O. Emery

K. O. Emery

KOE/cjc

27 December 1974

Dr. J. W. Devanney III
Associate Professor of Marine Systems
Department of Ocean Engineering, Rm. 5-207
MIT
Cambridge, Massachusetts 02139

Dear Jack:

I have spent some time on the Environmental Impact Statement. As you can see from my several specific comments, I'm not sure whether it was not only hastily written but also hastily written by a bunch of incompetent people. Although I'm not impressed by the EIS, I am convinced that it is desirable to assess the magnitude of oil and gas resources available to the U.S. as soon as possible.

Please feel free to incorporate the enclosed material in any way you see fit.

Sincerely,

Saul B. Saila
Professor of Oceanography

sg
Enclosure

Comments on - Draft Environmental Statement Proposed Increase in Acreage to the Offered for Oil and Gas Leasing on the Outer Continental Shelf DES 74-90.

Saul B. Saila

In my opinion, the environmental statement represents a loose rearrangement of material from diverse environmental inventories which have been recently conducted. The individual reports are far better than the attempted synthesis. It is very difficult for me to decide whether some of the errors in the text are merely typographical errors or whether they represent a real lack of understanding on the part of the writers. For example:

1) Vol. 1, p. 249. The quotation from the URI study is wrong. *Spisula solidissima* is not a polychaete.

2) Vol. 1, p. 252. The statement "Shad, striped bass, and river herring are among the species which spawn in tidal marshes" is wrong. None of these species actually spawn in tidal marshes.

3) Vol. 2, pp. 13-17 and 55-59 are identical. The amount of material is great enough without this kind of redundancy.

4) Vol. 2, p. 158, 1st line. The statement "No geographic area would have ten million acres offered in 1975, so effects would be generally less than those observed in the Gulf of Mexico, aside from catastrophic localized spills." is not based on any factual information. It merely says that if all areas responded like the Gulf of Mexico, then the expected effects in other areas would be less than in the Gulf of Mexico because they are smaller.

5) Vol. 2, p. 164. The statement "No evidence was found in the literature that spilled oil enters marine food chains via adsorption or absorption, by phytoplankton and subsequent ingestion by grazing herbivores" is

questioned and believed to be incorrect. See, for example, Gordon and Prouse, Mar. Biol. 22, 1973, pp. 329-333. The effects of three oils on marine phytoplankton photosynthesis - or, Muzzi, pp. 809-814. Effects of water soluble extracts of oil on phytoplankton. In: 1973 Conf. on Prevention and Control of Oil Spills, Published by API.

6) Vol. 2, p. 175. The statement "No information has been found on spilled oil affecting rumbers (sic) of the nekton other than finfish." is incorrect. See, for example, Atema, J. and L. Stein, 1972. Sublethal effects of crude oil on the behavior of the American lobster. PB213872. This omission is particularly significant as it applies to the Atlantic OCS where the American lobster is one of the most important of the exploited renewable resources of the area.

7) p. 180, middle of the page. The statement "We believe the duration of the impact will be short, with recolonization being completed within a year or two" is an oversimplification and is incorrect as it stands. The recolonization process will depend upon the latitude, the organisms, the nature of the substrate and a host of other factors which make prediction difficult. In any event, it will a variable, and may take as long as a decade in some cases.

8) pp. 266-275. This section is entirely inadequate. Most of the relevant questions are not considered at all. For example, in section 2 Impact socio-economic on Commercial Fisheries, no mention is made of potential on-shore conflicts such as competition for space, dockage, repairs, crew etc. between oil supply boats and fishing boats. No mention was made of potential legal problems or ways to resolve them.

9) p. 270 - The statement is made "Unburied pipelines (beyond the 200 foot depth contour) may pose a problem to bottom trawl fishermen." This

is an understatement - at least for the Atlantic outer continental shelf area. For example, bottom trawling occurs to about 350 fathoms or 2150 feet. In fact most trawling is at depths greater than 200 feet on the OCS of the Atlantic. I believe a serious potential danger of oil spills could result from the interaction of heavy fishing gear with oil pipelines in the Atlantic OCS and perhaps in other areas. The approximate depths to which gear is regularly fished in the Northwest Atlantic Ocean is as follows:

Bottom trawls	350 fathoms
Scallop dredges	50 fathoms
Lobster pots	400 fathoms
Scottish seines	300 fathoms

It should be also recognized that long lines may be as much as 35 miles in length and that they drift over an extended period and involve drift distances of 5-10 miles.

There is a history of fishing boat-cable interaction between the ITT TransAtlantic cable and commercial fishermen. In spite of burial there have been several incidents involving major expenses to both parties.

The problem of pipeline burial, pipeline routing, and protection is serious, and has not been addressed properly. No information on the maneuverability of towed gear or their performance characteristics has been presented.

No consideration has been given to the problem of tainted fish and shellfish.

In general as I reflect on these 2 volumes, I am more and more convinced that they do not represent an environmental statement, but instead, represent some kind of loose environmental inventory.

10) Vol. II, p. 307a. The statement "Drilling units contain compounds possibly toxic to marine life, particularly chromium compounds" is incorrect. The element is barium.

11) Vol. II, p. 307b and p. 311. On p. 307b the statement is made that approximately 6600 miles of pipeline will be needed if the frontier sales are held in Gulf of Alaska and the Atlantic. However, no mention is made of loss of fishing grounds as a result of these pipelines. On p. 311 a statement is made that from the estimated 500-1000 platforms required a minimum of 1500 acres of bottom will be removed from trawler operations. This is grossly inaccurate, since it says nothing about the maneuverability of fishing vessels towing fishing gear. I would guess that a no fishing buffer zone of about ½ mile radius would be required and each platform in the Atlantic area at least.

Summary:

I am of the opinion that drilling on the nation's OCS areas to establish the magnitude of the resources is in the national interest. I believe the technology is at hand to minimize damage to the renewable resources and the environment. I also believe the time is at hand to assess on a regional scale, the conditions and configurations which would minimize environmental, social, economic and aesthetic losses.

I don't think that this Environmental Impact Statement comes very close to either defining the problem or suggesting a reasonable course of action.

State of Massachusetts

Various agencies of the State government responded in great detail to the request from the State Clearinghouse for comments on the proposal to accelerate OCS leasing in 1975 and succeeding years. Each agency's comments are addressed in turn below. Many comments are mooted by the Department of the Interior modification of the proposal to be a proposed six sales per year in 1975 through 1978, with no specific acreage figures targeted. Many of the comments are also of such a detailed nature that the scope of the EIS was too broad to accomodate them. These detailed comments will more appropriately be dealt with in site-specific impact statements that will be prepared if lease sales are proposed in frontier areas. Comments that have been accepted by the Department as enhancing the quality of the final EIS will generally be acknowledged by the word "Editorial"; this indicates that the suggested change has been incorporated into the final EIS.

Disposition

Office of State Planning and Management - This office compiled the comments of the various State agencies, and concluded that the draft EIS was inadequate under NEPA. The contributing comments that led to this conclusion are addressed individually below.

Department of Natural Resources - Division of Marine Fisheries

Volume I

1. It is felt that extensive amounts of clean up equipment must be located at shore-based points in order to make effective use of such material over a large area. Nearshore spills can be arrived at in short transit times, whereas spills far at sea do not represent an immediate hazard to valuable coastal resources, and indeed, may not impact them at all if left to the natural effects of physical, chemical, and biological weathering. This is not to say that spills far at sea are to be condoned (Out of sight...etc.), but that the economics of site availability of large scale clean up equipment would prohibit most operations.

2. Inspection programs and technology assessment are discussed in the attachment of the USGS response to the issues raised in the University of Oklahoma report, Energy Under The Oceans.

3. It was not possible to compile all this information in the time available; we have received assurances from USGS that there is close to 100% compliance with the requirement for subsurface safety control.

4. This suggestion is now on the record.

5. The expertise of the NMFS and various State fishery agencies is well known in the Department; a workshop has already been held in the North Atlantic region to address these problems and suggest to BLM the methodology of baseline studies on the fishery resources. Study plans are now being formulated for these studies.

6. The State of Massachusetts already has a representative on the OCS Research Management Advisory Board.

7. As noted earlier, the environmental studies in the North Atlantic are in the study plan formulation stage, after the workshop made its recommendations to BLM for conduct of the research. The NMFS has not been excluded from consideration; on the contrary, their background information and expertise will be relied upon heavily in determination of historical catch data and possibilities of impacts on the valuable New England fisheries.

8. Weather conditions are factored into the analysis of hazards from natural conditions in Section III on Impacts.

9. Foreign fishery harvests from specific areas are difficult to assess, due to the reluctance of these commercial operations to divulge the exact sources (locations) of their catch. It is well known that New England fisheries are among the most productive in the world, but this breakdown seems beyond the capacity of this EIS.

10. See argument presented above (9).

11. The management or jurisdiction question may soon be resolved by the possibility that the U.S. may extend its fishing limits (protection of stocks) to 200 miles. This would moot this question.

12. Possibilities for management of domestic fisheries is beyond the scope of this EIS.

Volume II

1. Baseline environmental studeis will precede exploratory drilling and production in all cases; however, OCS lands could conceivably be leased before baseline studies are completed, as is evidenced by the manner in which studies have been conducted in the eastern and western Gulf of Mexico.

2. This possibility has been addressed in the final EIS; see Section III under Generic Impacts.

3. Editorial correction - 50 ppm is correct.

4. Impacts on such important meroplanktonic organisms has been included in Section III.

5. It is generally agreed that spills can and probably will occur whereever there is oil and gas operations. It is felt that the current system of mitigation developed over many years provides an effective constraint on the possibility of large spills.

6. Again, fishery stocks and the important life stages such as larvae and juveniles which affect year-class development are discussed in Section III.

7. This fact has been pointed out. What must also be re-iterated is the fact that the West Falmouth oil spill was a refined product, not crude oil, and thus was inherently more toxic.

8. No comment appears necessary.

9. Editorial

10. The spacing requiremants are not stipulated by a certain distance;

OCS operating orders dictate that spacing and the number of platforms shall be selected to insure maximum field development with the minimum amount of heavy equipment and operations.

11. The BLM hereby advances the proposal that similar requirements for pipeline burial will apply in the North Atlantic and that pipeline corridors must of necessity be sited with the historical fishing areas in mind, so that conflicts can be kept at an absolute minimum.

12. Again, impacts on ichthyoplankton are found in SectionIII.

13. The problem with such a monetary assessment in deciding what value to place on the resources, if indeed one can quantify the magnitude of impact caused by the event. Suggestions on how this would be accomplished are requested of Massachusetts Marine Fisheries group.

14. This final EIS uses the CEQ methodology to some extent to analyze the relative environmental risk of development in each of the OCS regions. The CEQ report should be consulted for a full explanation of its methodology. It is a report to the President entitled OCS Oil and Gas - An Envrionmental Assessment dated April, 1974.

15. Federally conducted exploration and off structure stratigraphic drilling are discussed in greater detail in Section VIII.

16. Maximum protection of living resources is one of the overriding interests of the Department through the agencies that currently manage and supervise operations--the BLM and the USGS.

Water Resources Commission

I.B. The endorsement of the NOAA recommendations is acknowledged.

I.C.2. The bulk of research and development of more effective ways of dealing with spilled oil on the high seas is conducted by Federal Government through the U.S. Coast Guard and Navy. Ongoing research will hopefully overcome the problems of working in rough conditions.

II.A.1. The high seas in the Georges Bank area are noted and factored into the natural hazard analysis of that region in the area-by-area comparison in Section III. Site-specific impact statements will examine this problem in greater detail.

Oral Testimony of Evelyn Murphy, Secretary of the Executive Office of Environmental Affairs

Page 790, para. 3 - Revenue sharing is not an issue of environmental concern. Alternative OCS policies are discussed in Section VIII.

Page 790, para.4 - The policy decision on accelerated leasing has not been made, and the planning schedule (now updated, see page 2 of final EIS) is a tentative plan for implementation of the proposal. The final EIS addresses this schedule and alternatives to that schedule, including the alternative of non-acceleration of OCS leasing.

Page 791, para. 2 - Although a decision may be made to accelerate the consideration of several more areas each year than was planned earlier, each sale proposal will still be evaluated on its own merits.

Page 791, paras. 3,4,5 - The proposal as now stated in the EIS is to accelerate OCS leasing according to the proposed schedule, which has an underlying premise of conducting six lease sales per year for the period 1975 through 1978.

Page 791, last para. - USGS estimates used in the final EIS for calculating throughput spill volumes (see Section III) are based on the most recent estimates that appeared in June, 1975 through FEA.

Page 792, para. 1 - Estimates of potential oil spillage for each OCS region are presented in the final EIS based on the historical spill rate, anticipated volume of oil, and natural hazards to development in each area. Section III.

Page 792, para.2 - NEPA mandates that the environmental setting be described; since this is a herculean task for all OCS regions, each area can only be briefly described. This still produces a large amount of background information, much of which is not analyzed. Oil spill trajectory information, however, is used in Section III on impact.

Page 792 to end of testimony - The entire section on impacts has been revised to focus more on identifiable impacts and their relative magnitudes. Various combinations of energy alternatives are explored, as the analysis now benefits from several new sources: the Project Independence Blueprint, the Ford Foundation Energy Policy Project, and the University of Oklahoma recent analysis of energy alternatives. These documents were not available during preparation of the draft EIS. Public or Federally conducted exploratory drilling is discussed in greater detail in the final EIS. Finally, questions of revenue sharing do not seem appropriate to an environmental impact statement.

Oral Testimony of Matthew Connolly, Director of the Massachusetts Coastal Zone Management Office

In general, the Director's comments are directed at several presumed deficiencies that have either been corrected or determined to be of such detail that, if the same level of analysis were applied to all areas as is suggested for the North Atlantic, the document would be completely unmanageable. Many of the potential effects on fisheries are discussed in generic fashion in Section III; a site-specific impact statement on the North Atlantic would examine in detail many of the potential impacts which the Director raises. Resource information in both Section II and III for comparison with the risk analysis that is presented in Section III.

The Director presented some provocative questions that have been addressed elsewhere, where possible, but which in general represent a compendium of many of the unanswerable questions of any OCS development. These unknowns are acknowledged in the final EIS where that is the case, but several conflicting occurrences need comment. On page 798, middle paragraph, it is stated that land-based impacts may be significant, and should not be undertaken without sufficient study. Specifically in Rhode Island, the Department wonders if that State's planning is so far developed that it can advertise for rig builders to utilize abandoned Navy bases for rig construction. (Ocean Industry, May, 1975, p. 19). Additionally, the EIS admits the difficulty of analyzing what amount of new refining capacity is induced by potential OCS development. There has been a large amount of pressure for new refineries even before the expanded leasing proposal was put forth by the Department. The EIS states that OCS production may not affect the plans for capacity enhancement, but only affect the siting decisions. The BLM has recently (June, 1975) advertised for proposals to analyze the very question presented above.

The Departmnet feels that Coastal Zone Mangement plans can be implemented by states before OCS development has any large scale impacts. Additionally, states have been involved to a large degree in decision-making regarding OCS development, through review of EISs and baseline study plans, through Governors' conferences, and through participation in the OCS Research Advisory Board and the recently proposed policy level component of that Board.

Most, if not all, the concluding recommendations on viewing OCS development in light of national energy needs,etc. are discussed as alternatives in the final EIS - Section VIII.

Report of the Coastal Review Center

Page 2, para. 1 - It was stated at the outset of the EIS that it was a program EIS, and its broad scope dictated a cursory examination of the potential environmental impacts of the proposal. Each element of the proposal, i.e., each lease sale proposed on the tentative planning schedule will be subjected to in-depth environmental assessment when that specific lease sale proposal is made. The programmatic EIS addresses the broader impacts of proceeding in one particular sequence of lease sales or another, and in the time frame proposed as well as longer time frames. The charge that the cited statements on the two pages following show a bias toward minimizing environmental impacts is an artifact of our lack of knowledge of the magnitude and duration of many of these impacts, the lack of firm evidence that oil and gas accumulations underlie any of the regions, and the fact that many of the impacts derive from accidents which can not be predicted. Also, those impacts that are known from experience in the Gulf of Mexico can not be easily applied to frontier areas with conditions largely different.

Format changes here to follow pagination of EIS

Volume I

Page 192-This submarine landslide is mentioned in the discussion of the seismic risk of development in the North Atlantic (Section III).

Page 207 - Specific examples of storms seems too detailed.

Page 216 - For the layman to understand the water masses of the North Atlantic, this seems like appropriate detail.

Pages 247, 252, 260, 553 - While some editorial correction has been made on incorrect statements, we fail to see why the environment can not be most simply described by inventories, lists of flora and fauna in the regions and simple descriptions of interactions.

Page 665 - A detailed description of the Georges Bank Fishery is more appropriately the purview of a site-specific statement. However, the enormous value of this resource is repeatedly mentioned in the EIS.

Page 696 - Editorial correction.

Volume II

Pages 157, 159, 161, 160, 162, 165, 169 - Direct quotations from these pages in the draft EIS are held up as indicative of several deficiencies on the part of the authors' perspectives. While these deficeincies may in fact be real, they spring from continual contact with the problem and the non-appearance of solutional methodologies. Perhaps the most completely studied crude oil spill is the Santa Barbara Channel blowout. An investigation of the many reports that that event fostered does little to allow confidence in the predictive capabilities of science at the population, assemblage, or community level. Rather than engaging technical or theoretical discussions concerning impacts on these levels, the means of approaching these problems should be discussed for viability, validity, precision, and tractability.

IV. Alternatives to the Proposed Action

The notation of deficiencies in this section revolve around the non-existence of a National Energy Plan which spells out in detail what the contribution of each and every energy source will be in different time periods from now until the turn of the century. The OCS programmatic EIS does not attempt to provide such a plan, nor should it. The contribution to National energy supply under an accelerated development schedule is presented, along with a generalized picture of the impacts that are associated with such development. The decision that will devolve from this document relates to what areas will be subjected to more intensive environmental analysis and in what time frame. Each of those individual sale proposals will then be evaluated for their particular advantage/disadvantage balance. The point is made in Section VIII that the present system of incremental development of energy sources is either the proper way of developing these resources, or what a National Energy Plan would become in order to have some flexibility. Other plans are cited in this EIS as pathways for the Nation to follow in achieving long-term supplies of energy.

Review by Members of the Faculty of the University of Massachusetts, Amherst, in cooperation with the Center for Environmental Policy Studies, Institute for Man and Environment

As many, if not all, the issues raised by this group of scientists have been addressed earlier in the State's comments (these comments were supplied to the Coastal Zone Office and the Executive Office for Environmental Affairs, both of which were examined earlier), or represent matters of such detail that this broad scope EIS can not address them, no response will be given specifically. Rather, they will be utilized by an EIS preparation team when a lease sale is proposed for the North Atlantic region.

New England Regional Commission

I. While one might find the argument appealing that producible life of the OCS oil and gas fields should be completely analyzed, such a rigorous approach is not really possible at this time. The majority of our OCS lands are unexplored, i.e., there has been little if any exploratory drilling in most areas. While estimates of oil and gas potential can be made on the basis of seismic records, drilling is still the only method which allows verification of the existence and extent of these deposits. One could thus generate as many scenarios of OCS producibilities as there are estimates of potential, and there are several. The recent USGS estimates of undiscovered recoverable resources are used in the analysis of oil spill potential for each of the OCS regions (Section III).

II. The same argument applies as given above. The possibilities of refineries in certain locations are discussed in Section III, also. The effects on oil prices are beyond the scope of this EIS.

III. Many of these comments quite obviously found their way into the testimony presented earlier by the Director of the Massachusetts Coastal Zone Management Office, and are responded to there. Some other considerations are presented (world starvation, impairment of fish resorces to depletion) that are well removed from the realm of analysis.

IV. The EIS does not purport to offer a National Energy Policy, but rather attempts to assess the impacts of OCS development in the various areas, without regard to what can or can't be produced.

a. See response to I above.

b. The revised section on energy supply strategies in Section VIII addresses these issues, and presents alternatives.

c. Again, the EIS does not pretend to present a National Energy Policy based on different levels of possible OCS oil and gas production. However, many of the alternative energy sources are compared to OCS oil and gas regarding their ability to replace oil and gas in the near and long terms, as well as the impacts associated with their development.

V. Increased domestic supply of oil will replace imported oil in refineries, given minimal effects of conservation measures. The number of refineries is thus not dependent on whether the OCS is produced, given these conditions regarding conservation. Thus, development of the OCS will not produce increases in lung cancer, etc. per se.

The remainder of comments in this section V either agree with what was presented in the draft EIS, or present material which is identical to what has been presented earlier, except for f). We find it difficult to believe that someone thinks that the outer bounds of the marine ecosystem's ability to absorb stress will ever be known. No attempt at humor or a put-down, simply scientific incredulity and good wishes.

VI. The only serious alternative to OCS development that cancels any possibility of public health hazards is conservation. SectionVIII.

VII. Postponement for various reasons (development of a National Energy Plan, awaiting coastal zone plans) are discussed in even greater detail in this final EIS. Delay has some obvious advantages, but also some potential disadvantages. If conservation efforts are not completely successful, then some would make the argument that delay at this time, given the several years' lead time necessary for even moderate development of the OCS, would be the most incorrect decision this country has ever made. Exploration at this time at least allows more precise estimation of the Nation's reserves.

VIII. The issues raised in this section have been addressed earlier, specifically in the testimony of Evelyn Murphy and Matthew Connolly.

IX. The range of mitigating measures which the Government can take to reduce or eliminate adverse impacts to the marine and human environments are outlined in Section IV.

STATE OF MISSISSIPPI
OFFICE OF THE GOVERNOR

WILLIAM L. WALLER
GOVERNOR

WM. M. HEADRICK
COORDINATOR OF FEDERAL-STATE PROGRAMS

STATE CLEARINGHOUSE FOR FEDERAL PROGRAMS

DR

TO: (i) Mr. ~~Donald~~ Truesdell or (ii) Mr. Thomas Burke
United States Department of the Interior
Bureau of Land Management
Division of Minerals Environmental Assessment (730)
Washington, D. C. 20240

State Clearinghouse Number
74112002
Date: April 1, 1975

PROJECT DESCRIPTION: Draft Environmental Statement, Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf.

(x) 1. The State Clearinghouse has received notification of intent to apply for Federal assistance as described above.

(--) 2. The State Clearinghouse has reviewed the application(s) for Federal assistance described above.

(--) 3. After proper notification, no State agency has expressed an interest in conferring with the applicant(s) or commenting on the proposed project.

(--) 4. The proposed project is: ( ) consistent ( ) inconsistent with an applicable State plan for Mississippi.

(x) 5. Although there is no applicable State plan for Mississippi, the proposed project appears to be: (x) consistent ( ) inconsistent with present State goals and policies.

COMMENTS: The attached letters from the Mississippi Marine Resources Council and the Superport Coordinating Office are made a part of this Final Clearinghouse action.

This notice constitutes FINAL STATE CLEARINGHOUSE REVIEW AND COMMENT. The requirements of U.S. Office of Management and Budget Circular No. A-95 have been met at the State level.

E. A. May Jr.
Edward A. May, Jr.
Clearinghouse Director

SUITE 400. WATKINS BLDG. • 510 GEORGE STREET • JACKSON 39201 • (601) 354-7570

William L. Waller
Governor

J. E. Thomas, P. E.
Executive Director

Mississippi Marine Resources Council
Post Office Box 487 ○ Long Beach, Mississippi 39560 ○ 601-864-4602

February 20, 1975

Mr. Edward A. May, Jr.
Federal-State Programs
Suite 400, Watkins Building
510 George Street
Jackson, Mississippi 39205

Dear Mr. May:

The Mississippi Marine Resources Council has completed a review of a draft environmental statement, Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf, prepared by the Bureau of Land Management, U. S. Department of the Interior. These comments have been coordinated with the Gulf Coast Research Laboratory, the Mississippi Marine Conservation Commission, and the Gulf Regional Planning Commission. Of these organizations, only the Gulf Regional Planning Commission submitted comments. The comments of the Superport Coordinating Office have been incorporated in our analysis.

The draft statement concerns the State of Mississippi in that it addresses acceleration of leasing offshore lands by the federal government above original program intentions. Submerged lands in the Gulf of Mexico offshore of Mississippi are included in the areas proposed for lease to accelerate development of the nation's petroleum resources.

The State of Mississippi has previously adopted the position that development of the nation's offshore petroleum reserves was the most logical available alternative to increase domestic energy production. That should remain our position. In addition, Mississippi has advocated the development of offshore deepwater port facilities as the safest means of satisfying our petroleum import requirements. Indeed, Mississippi, in close cooperation with Alabama, has embarked on an active program to construct a deepwater port facility in our offshore waters. Such a port facility would employ the latest technology and environmental safeguards.

Development of the offshore submerged lands at an accelerated pace as well as deepwater port developments will require that the coastal areas of Mississippi and Alabama bear a substantial share of the brunt of development and impacts that will accompany such massive national programs. Many studies of existing offshore operations and present programs related to offshore petroleum development have demonstrated there is a significant impact on the coastal areas adjacent to such development. These impacts are often manifested in the form of significant population increases and the attendant increased demands for schools, roads, utilities, transportation networks, sewers, water supplies energy supplies, and other demands that accompany such population increases. All of this type of development will cause environmental impacts in the coastal area. Offshore leasing and petroleum development does not provide the states and local governments with any funds to accommodate or plan for these increased demands and impacts.

The draft statement is clearly inadequate in describing the impacts resulting to communities impacted by offshore leasing, and further fails to address mitigating measures that could be incorporated to help the state and local governments ameliorate the adverse environmental and social impacts resulting from intensive offshore leasing and petroleum production.

Section IV, relating to mitigating measures included in the proposed action, does not even address the question of onshore impacts and how they may be minimized through proper planning, coordinated review of development plans with successful bidders on tracts, or other administrative opportunities available. Likewise, although the statement provides detailed documentation, through references, on the biological resources and impacts thereon resulting from offshore production, little information and supporting documentation is provided for the onshore impacted areas, even though the most significant impacts may take place here.

It is our belief that the federal government has failed to provide not only adequate description of the probable onshore impacts, but has also failed to develop mitigating measures that would lessen or make less traumatic the changes that coastal states will have to make to accommodate the pressures arising from offshore petroleum exploration and development. Immediate remedial action is necessary to assist the various states in coping with the activities arising from offshore petroleum development.

We appreciate the opportunity to comment on this statement.

Sincerely,

JE Thomas

J. E. Thomas, P. E.
Director

LEG:gg

RECEIVED
FEB 2[illegible] 1975

THE IMPACT OF OUTER CONTINENTAL SHELF LEASING

SUPERPORT COORDINATING OFFICE

I appreciate the opportunity to express my views on the proposed leasing of the Outer Continental Shelf.

I wholeheartedly support the proposal to develop the petroleum resources of the Gulf of Mexico. The economic health of the country and the continued well-being of its people demand that we proceed without delay to explore for, produce, transport, and refine the crude oil and natural gas which may underlie waters off the United States.

Offshore oil, by necessity, will have to supply increasing amounts of oil for world consumption. Offshore production already represents 17% of the United States' domestic output of oil and 15% of natural gas. Ultimate reserves in offshore areas have been estimated at 160-190 billion barrels of oil and anywhere from 820 to 1,100 trillion cubic feet of gas. To meet the rising demand for energy in this country, these reserves must be utilized, as well as conservation and other efforts.

Energy production and consumption are both essential elements in the high standard of living sought in the United States. Our resources—economic, social, and natural—are such that Americans can enjoy a higher standard of living than anywhere else in the world.

However the eastern part of the United States consumes vast amounts of energy while being almost totally dependent on the power resources of other areas of the country. The Southeastern United States should develop its own offshore oil and gas resources to maintain its rising standard of living.

Mississippi is no exception. The State is working hard to raise the level of per capita income. In 1973 the state made great strides forward with the announcement of 205 new and expanded industries that created 19,039 new jobs with a capital investment of $1,117,397,000. This represents a 27% increase over 1973's capital investment in industrialization. The upward movement of this long depressed economy will be brought to a sudden halt if there are not sufficient petroleum products and natural gas available to service this new industrialization.

Our problems are now and our solutions must be now. But no state can act alone and independently of all others to assure its citizens of an adequate supply of energy.

It is useless to try to assign blame for the crisis we endure today. Everyone--government, industry, an apathetic public and overzealous environmentalists--must bear some responsibility. If we agree, however, that the energy crisis is a man-made one resulting from poor planning, then it follows that we can achieve solutions through good planning.

While recognizing the need for environmental standards which assure personal health and safety, we must tell environmentalists that we shall no longer abandon or delay actions to provide energy for our country in order to achieve other environmental objectives which are of lesser importance and urgency.

We must stop thinking of our energy industries as adversaries trying to get rich at our expense. These industries are servants of the people and we must all find ways--as we are trying to do in Mississippi--to provide tax and other financial incentives for them. Private companies cannot find and produce the oil and gas we need unless it is profitable to do so. So, we must make it profitable--not to help the companies but to help ourselves to get the energy we need.

Mississippi is trying to face squarely the problem of energy supplies and to work as an active partner with industry, with other states and with the Federal Government toward reasonable solutions. The problem is great and complicated and many actions will be required to overcome it. Mississippi is taking actions.

First, the vast public domain and the continental shelf must be opened to exploration without delay through reasonable leasing regulations. It is beneath these lands that we are most likely to find the additional oil and gas we need so badly. Mississippi has already taken steps toward leasing its state-owned offshore properties.

Second, a deepwater port should be constructed offshore from the Mississippi-Alabama coast. Our close study of this project has necessarily resulted in our reviewing much information pertinent to the matters under consideration here. Proper planning and environmental considerations of both go hand-in-hand toward solving some of our energy problems.

Mississippi and Alabama have an opportunity to originate a brand-new, grass-roots energy system extending from the Mobile-Pascagoula area to a large segment of the United States. The system will be all new--the best technology, the best land use concepts, the best environmental protection now available. We are talking about a deepwater port, onshore terminals, refineries, pipelines and all of the other facilities necessary to receive and process crude oil and to transport the products derived from the oil to the consumer. This region can be developed into a national petroleum and national refining center on the Gulf, in which both imports and crude produced from lease sales can be received and processed with the least assault on our environment.

We recognize that there will be some potential environmental damage from an oil spill. We believe, however, that with modern technology this hazard can be minimized and kept to acceptable levels. Offshore oil and gas drilling and production operations worldwide have been noteworthy in their proven record of reducing and maintaining minimum oil spills from accidental or operational incidents. It is interesting to note that of all sources of oil pollution, offshore production operations represented only 2.1% while automobile crankcase oil disposal resulted in 29.4%, the largest source of all pollution. During the nine-year period prior to 1973, approximately 2.6 billion barrels of oil and condensate were produced in the Gulf of Mexico. The amount of recorded spills during this period represents less than 0.02% (two one-hundredths) of a percent of the total. With current technology and under new regulations, we feel confident that spillage can be virtually eliminated.

Mississippi has a deep concern for the quality of our environment, and we are determined to maintain a healthful environment for our citizens. We have an effective, aggressive Air and Water Pollution Control Commission. Mississippi is the only state bordering the Gulf of Mexico which has a wetlands protection law. We have developed a coastal zone management program under the Mississippi Marine Resources Council and Mississippi was the first state to apply for coastal zone management funds from the Federal Government.

The declared public policy of Mississippi is to preserve the natural state of the coastal wetlands and their ecosystems except where their alteration would, within acceptable limits, serve a higher public interest.

Despite our positive attitude toward the protection of our environment, we are concerned about the philosophy current in some areas that environmental issues are paramount to the public interest--superior even to food, clothing and shelter for our citizens. In fact, all these basic human needs are co-equal and they must be considered in perspective. Energy is one of these basic needs. Mississippi and the nation must immediately do all within our power to see that this need is met.

State of Mississippi

The State Clearinghous for Federal Programs submitted a final review and comment, which consisted of letters to the Clearinghouse from the Mississippi Marine Resources Council and the Superport Coordinating Office. The Clearinghouse noted that it had received notification of intent to apply for Federal assistance and that the proposed project appears to be consistent with present State goals and polices, although there is not an applicable State plan for Mississippi.

Disposition

The Mississippi Marine Resources Council criticized the draft EIS for lack of sufficient detail regarding specific impacts (both ecological and socio-economic) to the coastal zone, presumably of Mississippi. The scope of the programmatic EIS is larger than the specific impacts on each and every region. This is the primary reason that the Department states that each and every proposed sale that ensues from this EIS on accelerated leasing will have a separate draft and final EIS, with a public review and comment period, and public hearings, held between the two impact statements. These so-called "site-specific" impact statements will address the types of issues that the State raises. Mention is made in the present program EIS of possible OCS revenue sharing (an option presented to President Ford by Former Interior Secretary Morton) and legislative proposals for an oil spill liability contingency fund, and impact funds from the Coastal Zone Management Act of 1972.

The Superport Coordinating Office recommended proceeding with offshore development through good planning efforts, and that the danger of offshore spills is quite low and can be minimized. No further comment seems necessary.

OFFICE OF COMPREHENSIVE PLANNING
STATE OF NEW HAMPSHIRE
STATE HOUSE ANNEX, CONCORD 03301

December 27, 1974

United States Department of the Interior
Bureau of Land Management
Division of Minerals Environmental
  Assessment (730)
Washington, D. C. 20240

Subject: Comments on Draft Enrironmental Impact Statement (DES 74-90).

This letter responds to the request of the Bureau of Land Management for comments of the draft Environmental Impact Statement (DES 74-90) covering the proposed increase in acreage to be offered for oil and gas leasing on the Outer Continental Shelf (OCS). Comments are attached and represent the views of this office. Other agencies of this state providing comments on the draft EIS are the Office of the Attorney General and the Department of Fish and Game.

Sincerely,

James E. Minnoch
Director of State Planning

JEM:am

Enclosure

OCP December 30, 1974

NEW HAMPSHIRE COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED INCREASE IN ACREAGE TO BE OFFERED FOR OIL AND GAS LEASING ON THE OUTER CONTINENTAL SHELF

General

These comments will address the policy level considerations which are engaged at this time by the issue of oil and gas leasing on the Outer-Continental Shelf (OCS). Specific commentaries will be made on OCS policies within a context of the broader subject of energy and to those impacts and questions which arise from OCS considered as an alternative to which the action appears committed.

OCS and a National Energy Policy

It is possible to lose sight of the fact that it is only the extent and location of possible leasing which are under consideration by the environmental impact statement (EIS) and not a specific lease sale. The chief shortcoming of the EIS is that its presentation as a policy level matter is not within a context of policies.

At this level of examination, OCS must be viewed as one of several energy alternatives available to the nation in its efforts to achieve independence from non-U. S. oil resources. The EIS manages to treat other energy alternatives so superficially that an adequate comparison of energy sources is not presented with estimated development times, energy potential and order of magnitude costs. No federal energy policy places OCS exploration and development within the context of a larger energy policy. Until such a national policy is developed with priorities and some concept of associated costs, OCS development should remain an unprioritized alternative with leasing permitted only for exploration. Subsequent to adoption of a federal energy policy, the scope and magnitude of required OCS development may better be known. It may be possible to limit leasing or to terminate the leasing program after discovery of adequate reserves. As the leasing schedule now appears, it is possible that all tracts may be leased, explored, and developed even if the OCS element of an energy program has long since over-subscribed its portion of the program. The apparent open-endedness of the OCS program should be corrected by law or by contractual language to prevent over-exploitation of oil reserves and perpetuation of reliance upon fossil fuels and also to prevent further environmental impacts beyond those incurred in fulfilling a role in a national energy program. The basic policy question to which the EIS addresses itself (i.e. the extent and location of possible leasing) cannot be fully answered until a national energy policy is adopted.

OCS as a Probable Alternative

Irrespective of the foregoing, it is evident that OCS exploitation is going to occur in some locations sooner or later. These comments are intended to relate directly to the impacts of such a program.

Technology and Risks. Oil spills are a primary cause of concern. Whether large or small, their cumulative impacts will be serious. The EIS concludes that, sooner or later, a major spill will occur wherever there is significant development offshore.

It is also asserted that thousands of minor spills will occur. The EIS contends that significant amounts of oil spilled from platforms would not reach most coastal areas because of the distance from shore, winds, currents and clean-up operations. Data presented with the EIS does not permit judgements on this particular risk. In fact, the location of oil bearing structures are best known to oil companies whose exploratory work is not available to the public. If such information is made available at the time a specific draft EIS is prepared on each leasing proposal, review agencies will be better able to assess impacts.

The EIS admits that biotic communities, offshore and onshore, will be disrupted from drillings, toxic chemicals, cuttings, oil discharges and pipeline burials. It is not possible to estimate the potential environmental impact from EIS data in view of conflicting and inconsistent data on a possible number of wells listed on pages 282,301 and 319, Volume 2. These estimates, even if based upon a possible high and low number of wells cannot be translated into a percentage of acreage in the Georges Bank. Accordingly, it is not possible to assess impact on commercial fishing in that area.

Pipelines, according to the EIS, have a practical limit of 100,000 feet. It seems likely that pipelines may be much longer, particularly in view of some North Sea pipelines which are 115 miles in length. Nevertheless, too little attention is paid by the EIS to pipeline impacts. No estimates are made nor any basis provided for estimating the number of pipelines which might be required. Such an estimate might be made on the basis of a hypothesized production rate and various sizes of pipe. In this way, some concept of the amount of pipeline dredging, offshore and onshore, might be formulated.

Baseline Data. It is widely agreed that insufficient baseline data exists to enable measurement of impacts on biotic communities onshore and offshore. There is some effort in the EIS to apply the Louisiana OCS experience to the New England states. Too many differences exist between these areas in climate, biota, shoreline geologic formations, socio-economic condition and traditional attitudes.

It is unclear that TRIGOM baseline studies, undertaken at the initiative of the Department of Interior, are intended to suffice for baseline studies associated with future specific EIS, or whether additional baseline studies will be necessary. In any case, if new data is required, the time provided in the leasing schedule between a call for nominations in the North Atlantic (April 1975) and the date a draft EIS is due (November 1975) appears grossly insufficient to initiate and complete new baseline studies.

Socio-Economic Impacts. Comparatively little attention is given by the EIS to the crucial onshore impacts. Testimony provided to National Ocean Policy Studies provides ample warning to coastal communities that they may expect large costs if OCS related development occurs. In Louisiana, California and Alaska, the social costs of environmental pollution have been borne by the local community. A recent computer projection by the Texas input-output model also predicted that public OCS related expenditures would greatly offset OCS related revenues. Even Louisiana, where the state enjoys considerable revenue from wells within the three mile limit, revenue is decreasing as industry moves further offshore. Since all Georges Bank oil is certain to lie outside the three mile limit, New England would receive all the OCS disadvantages and few benefits.

What is suggested by these dangers is that the states share in federal revenues from OCS exploration and that such monies be returned eventually to the local communities most impacted. Senate Bill 3221 will greatly assist states and local communities to meet such costs.

OCP December 30, 1974

Supervision and Safety. Supervision and enforcement of operating orders will be a crucial part of making OCS development acceptable. The EIS does not make a convincing case for future effective supervision.

Safety devices for subsurface production equipment, pipelines and drilling wells listed on page 97, Vol. 1, should be required before USGS gives approval for an operating plan. The best available technology should also be required.

A ratio of inspectors to platforms or producing wells should be developed and that ratio used to structure an inspection force under USGS.

Coordination with Other Programs and Agencies. The EIS states that a comprehensive regional planning effort will be required to properly integrate OCS induced development into a regional economy. Further, the EIS states that federal or state planning support will likely be required. One immediate change to the present two-tier planning system would be useful. This change would add a third tier which would involve regional agencies in the preparation of EIS specifically related to leasing proposals.

The most important aspect of coordination of OCS development and other programs concerns the Coastal Zone Management Act. A strong case can be made for regarding Coastal Zone Management Agencies as the loci of interests for OCS related matters. National Ocean Policy Studies, CEQ and others are in agreement on the close relationship of these two activities. Federal funds for local communities impacted by OCS development should be routed through the Coastal Zone Management Program. Further, the state Coastal Zone Management Agency can provide an umbrella organization for coordinating an Oil and Hazardous Substance Pollution Contingency Plan.

Actual lease sales should be postponed until each state likely to be impacted by OCS development has received approval of the Secretary of Commerce for its Coastal Zone Management Program.

OCP December 30, 1974

The State of New Hampshire

ATTORNEY GENERAL
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DEPUTY ATTORNEY GENERAL
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December 31, 1974

United States Department of the Interior
Bureau of Land Management
Division of Minerals Environmental
Assessment (730)
Washington, D. C. 20240

Re: Comments on Draft Environmental Impact Statement (DES 74-90)

Gentlemen:

Enclosed are the comments submitted by the Environmental Protection Division of the Office of the Attorney General of the State of New Hampshire.

Very truly yours,

Donald W. Stever, Jr.
Assistant Attorney General
Environmental Protection Division

DWSJr:klc

Enclosure

COMMENTS OF THE ENVIRONMENTAL PROTECTION DIVISION, OFFICE OF THE ATTORNEY GENERAL, STATE OF NEW HAMPSHIRE

These comments address (1) procedural compliance with the National Environmental Policy Act of 1969, and shortcomings of the Draft Environmental Statement with respect thereto, and (2) specific procedural and technical matters and matters involving water quality, submitted on behalf of the New Hampshire Water Supply and Pollution Control Commission.

1. Procedural Comments - General

On Page 17 there appears the following statement: ". . . the impact statement is more of a planning document than previous site-specific OCS oil and gas impact statements have been." This statement is preceded by several paragraphs that accentuate the generality of the subject treatment contained in it. In the overall context of the substance of the document, these introductory statements appear to constitute a rationalization of its inadequacy. Unfortunately, NEPA does not permit lesser analyses by agencies who lump a series of projects into one impact statement. Just as it has been held that the intent of NEPA may not be avoided by segmenting a project into microcosms, it may also not be avoided by casting the program in such general terms that meaningful analytical assessment is impossible.

Cf. Scientists Institute for Public Information v. A.E.C., 5 ERC 1418 (D.C. Cir. 1973). It is just such vagueness, generality and lack of competent analysis that forms the essence of the OCS statement.

The statement appears to be little more than a compilation of data derived from other sources, organized in an only partially organized fashion, with conclusions about environmental impact that are vague and in most cases unsupported by critical analysis.

While we understand that the Department of the Interior intends to produce subsequent site-specific impact statements, we feel that the present statement requires a more analytical approach as an overall program assessment.

2. Specific Comments

The core of the statement is contained on pp. 157-427. The following inadequacies are noted:

(a) The statement does not provide a basis for the reader to form an intelligent judgment about the value of the project, for the New England area, as compared with its social and environmental costs. While we do not contend that a detailed cost/benefit analysis is required or even practicable for a statement like this, some effort must be made, in a logically, orderly fashion, to provide a basis to make an analytical comparison of the value of the estimated oil production (Vol. 2, p. 224) and the resultant economic benefit (Vol. 2,

p. 242) for New England, with the long-term estimated costs [negative impacts] associated with the estimated frequency and value of spillage, and the negative social costs and environmental degradation that is a secondary impact of the development of onshore facilities. The "summary" of impacts (Table 82) fails to do this with any degree of precision.

(b) The discussion of specific onshore impacts is inadequate. No explanation is given for the inclusion of the communities in Table 81, or the failure to include other communities, such as Portsmouth, New Hampshire. We are referred to a report, not provided, for the assumptions upon which the selection is based.

(c) The discussion of oil spill liability fails to assess the practical legal problems involved in collecting damages. It is not enough to say that the oil producers are liable (Vol. 1, p. 114). Can the states or impacted communities receive damages? By what route? Jurisdictional problems with state court proceedings are not noted, but are substantial. Limitations on liability under §311 of the Federal Water Pollution Control Act are not mentioned, nor is the potential limiting effect of the draft international liability convention. Finally, the aggregate costs both in terms of environmental impact and oil producer cleanup costs are not addressed, and no meaningful attempt is made at quantifying them.

(d) While the statement is replete with lists of past spills and estimates of gross amounts of anticipated spillage, there appears to be no meaningful effort to assess, for the New England area, where spilled oil will go and what will be the prime areas of impact from a spill. While this matter could be addressed in detail in future site-specific statements, it is relevant to the overall program, and should at least be approached in the project statement, in which it is not. Quite a bit is now known about the wind and current patterns in the Gulf of Maine, primarily from power plant environmental studies for the Atomic Energy Commission, but also as a result of publicly and privately financed plankton research. None of this data is utilized in the draft statement, but is important in attempting to assess the probable impacts on New England's major critical coastal ecosystems and recreational areas (mainly beaches).

State of New Hampshire

Comments were received from the Office of Comprehensive Planning and the Office of the Attorney General. Comments were not received from the Department of Fish and Game, as the letter from the Office of Comprehensive Planning indicates.

Disposition

Office of Comprehensive Planning

Many of the comments submitted by this office are similar in content and tone to the comments of the Environmental Protection Agency in the previous section on Federal agency comments. They will be highlighted here.

National Energy Policy - The final EIS makes the case that either 1) the Nation's present energy program of incremental development of energy sources is an appropriate policy or 2) a National energy policy would have to be so flexible as to make it similar to our present policy.

OCS as an Alternative - The USGS has provided hypothetical drilling sites for our analysis in Section III; these sites are derived from proprietary information within USGS and represent good estimates of where development might take place. Recent developments may make disclosure of the locations oil-bearing structures possible; see the attached proposed regulations on geological and geophysical surveys.

The impact on commercial fishing in New England is subject to many variables. Generic and cumulative impacts are discussed in this EIS; a site-specific EIS on New England development, should such development be rpoposed, would focus on the specific problems there.

Estimates for numbers of pipelines from various areas based on peak production levels have been supplied by USGS, and are furnished in Section III.

The TRIGOM studies are background literature studies. Actual oceanographic data collection will be performed in the near future. This baseline data will aid in EIS preparation; however, it is basically designed to assess pre-drilling conditions.

The socio-economic effects of OCS development, as well as the studies on costs and benefits to Texas and Louisiana, are discussed in Section III. It was deemed too massive a task to attempt to assess the socio-economic impacts of development in all potentially affected OCS areas in this EIS. These will be addressed in site-specific statements. Sharing of Federal revenues has been offered to President Ford by former Secretary Morton as an option in the OCS program.

New sections have been added on supervision and safety. See also response to EPA and Alaska comments.

The possible postponement of OCS leasing until coastal zone plans are approved is discussed in Section VIII.

Office of the Attorney General

1. The definition of the program has been modified to allow a more critical evaluation of how or if an accelerated leasing program should be implemented. A more analytical approach to region-by-region assessments is presented in Section III.

2. (a) The statement attempts to allow reasoned judgment on the value of the proposal to the Nation, not just one or another region. Economic benefits are not specifically addressed in this environmental impact statement, although many of the secondary environmental and socio-economic impacts are broadly discussed. The

regional picture for New England will be presented in a detailed fashion in a site-specific EIS for that region.

(b) In an EIS as broad in scope as this one, specific onshore impacts for all regions could not be identified. Generic impacts are identified; from this, States and site-specific impact statements can develop appropriate data for analysis in individual regions.

(c) Several proposals should allow for such liability and collection. The Land and Water Conservation Fund already in existence (see Section I) provides some relief to impacted areas. Recent additional funding of the Coastal Zone Management Act also provides for impact re-imbursement. Major legislative proposals that could amend the OCS Lands Act include proposals for an Oil Spill Liability Contingency Fund to be maintained at $200 million.

(d) Hypothetical spill trajectories are presented in Section III, using CEQ and Departmental analyses.

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DAVID J. BARDIN, COMMISSIONER
P. O. BOX 1390
TRENTON, N. J. 08625
609-292-2885

February 10, 1975

Mr. Curtis J. Berklund, Director
Bureau of Land Management
U.S. Department of the Interior
Washington, D. C. 20240

Dear Mr. Berklund:

This transmits our comments on DES 74-90, the Draft Environmental Statement on the proposed increase in acreage to be offered for oil and gas leasing on the continental shelf.

Section 102(c) of the National Environmental Policy Act requires your agency to include, in every recommendation affecting the quality of the human environment, a detailed statement by the responsible official on

(i) the environmental impact of the proposed action,

(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,

(iii) alternatives to the proposed action,

(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

(v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

The human environment has been interpreted by the courts to include the social and economic environment as well as the natural environment: businesses, communities, aesthetic amenities as well as strictly biological questions. Your

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Department, in opposing S.3221 in the last Congress, assured us in May, 1974, that the environmental impact assessment would consider all of these variables.

Regrettably, the draft before us is amateurish at best, silent at worst. The energy-economic significance of a massive lease auction -- advantages as well as disadvantages -- is not analyzed effectively, and the alternatives including a program to explore (rather than to lease) are not evaluated. Thus, only half a page notes the possibility of federal exploration and purports to "evaluate" same. See page 412 in volume 2.

As you realize, 1,300 blank pages stapled together would not an EIS make. The time that has gone into preparation, analysis, and discussion of the 1,300 pages might be criticized as little more than an obstruction to decision-making. I am confident, however, that the Department's intention is to accelerate orderly decision-making.

We appreciate the enormous task that confronts our Federal government in meeting the requirements of the Act. New Jersey is therefore ready to assist in that effort so that sound and prudent decisions may promptly follow.

Faithfully,

David J. Bardin

David J. Bardin
Commissioner

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFSHORE OIL AND GAS TASK FORCE

Detailed Comments on Department of the Interior's Draft Environmental Statement 74-90, Proposed Increase in Acreage for Oil and Gas Leasing on the Outer Continental Shelf

February 10, 1975

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STATE OF NEW JERSEY

DEPARTMENT OF ENVIRONMENTAL PROTECTION

OFFSHORE OIL AND GAS TASK FORCE

INTRODUCTION

These comments on the Department of the Interior's Draft Environmental Impact Statement, DES 74-90, "Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf," were developed by the Offshore Oil and Gas Task Force of New Jersey's Department of Environmental Protection. The responsibility and membership of the Task Force, which was established by Commissioner David J. Bardin on August 28, 1974, are described in Attachment 3 to these comments.

During the preparation of these comments, the Task Force was able to study several other analyses of the draft impact statement. We found the following analyses to be particularly valuable, and hereby incorporate them by reference into our comments.

1. Memorandum, dated November 21, 1974, by Arnold R. Wallenstein, Esq., of the New England Regional Commission.

2. Position paper, dated December, 1974, submitted by the Department of Natural Resources of the State of Maryland.

3. Comments, in the form of a letter with attachment, dated January 10, 1975, from Sheldon Meyers, U. S. Environmental Protection Agency, to the Director of the Bureau of Land Management.

4. Comments, in the form of a letter with appendices, dated January 30, 1975 from Gerald P. McCarthy, Commonwealth of Virginia, to the Director of the Bureau of Land Management.

Consistent with the procedures established for these hearings, we reserve the right to submit additional written comments on or before February 24, 1975. In addition, we note that the question of ownership of the Atlantic seabed and its resources is currently before the U. S. Supreme Court; in submitting these written comments the State of New Jersey is not waiving any right, claim, title to or interest in the Atlantic continental shelf or its resources.

Our intention is, by these comments, to evaluate and offer comments on the draft impact statement and more importantly on the assumptions behind it. We have endeavored to contribute to the goals for the management of the continental shelf as stated by the Department of the Interior, namely:

1. Orderly and timely resource development,
2. Protection of the environment, and
3. Receipt of fair market value for the public's resources.

We concur with these goals, but unfortunately are forced by our analysis to conclude that they are not met by this draft environmental impact statement.

Finally, we would be pleased to provide additional information on or elaboration of the points made in the detailed analysis to follow.

Glenn Paulson

February 10, 1975

Glenn Paulson, Ph.D.
Assistant Commissioner for Science
and Chairman, Offshore Oil and
Gas Task Force

I. Description of the Proposed Action

Obviously events since October have rendered obsolete much of the description in the section titled "Purpose of Proposed Action" in the draft environmental impact statement (hereafter called the EIS). As recently as January 31, at the Princeton meeting of Atlantic Coastal Governors convened by Governor Byrne, Interior Secretary Morton affirmed that the goal of leasing ten million acres of domestic continental shelf had been scaled down considerably, though Secretary Morton did not provide an alternate figure. We presume the next edition will contain a more realistic estimate of leasing goals for not only 1975, but for subsequent years as well.

We detect three fundamental assumptions implicit in this section and in the entire EIS, which we believe should be made much more explicit and which should have been included as such in the section titled "Underlying Assumptions." These are:

1) The assumption that there are in fact significant reserves of crude oil and natural gas under the continental shelf,

2) The assumption that production of such presumed reserves will automatically decrease the "reliance of the United States on imported energy sources... by approximately the amount of the domestic production increase," and

3) The assumption that leasing is equivalent to exploration and production.

These three assumptions deserve additional scrutiny.

First, regarding reserves, we concur in the belief that many areas of the continental shelf have the geologic potential to harbor crude oil and/or natural gas deposits. In this sense only, exploration on the continental shelf certainly enhances the prospects of finding new energy resources. However, the "enhancement of prospects" does not guarantee the eventual increase of supplies, particularly at a rate and level that could prove to be a substantial contribution to the nation's energy supplies over the next decade or two. It is illogical to assume that increased prospects will automatically be followed by increased supplies, yet this is the implicit assumption that seems to underpin the entire document. In terms of the nation's energy crisis, it is irresponsible to make such an assumption in a programmatic EIS without, in addition, clearly defining the potential consequences if that assumption is wrong.

The second assumption is, in effect, that one barrel of crude oil from the continental shelf will replace one barrel of imported crude oil. This is so simplistic as to be almost ridiculous. Such a situation would only come to pass if a very large variety of other steps were also taken that would, for example, freeze either absolute oil consumption or the relative growth rate of oil use, allow no expansion in refinery capacity, control in detail exactly the amount of crude oil used for such non-energy uses as food, fibers or pharmaceuticals, etc. The draft ignores such possible scenarios as:

> What if oil discovered on the Atlantic continental shelf is high in sulfur, and it is less expensive to import and refine low sulfur crudes rather than desulfurize continental shelf crudes?
>
> What if, given the high costs of domestic refining, it remains more economical for eastern utilities to import residual oil than purchase residual oil refined from continental shelf oil at United States refineries?
>
> If significant finds are made on the continental shelf, what if the OPEC countries shift their prices to undercut the costs of continental shelf production so as to assure themselves a United States market?

Third, accelerated leasing (the program proposed) is not equivalent to either accelerated exploration or accelerated production. An oil and gas lease is a hunting license. Under the system practiced to date, it is also a license to lock up the resource by not hunting at all for up to five years. Thus the proposed program to auction millions of acres of leases right away could conceivably delay serious exploration for another half a decade if the successful bidders prove to be more interested in protecting existing monopolistic positions than in expanding our national resource capabilities. Consider, in that regard, the possibility of bidding by American corporations controlled by the OPEC countries. The draft fails to consider the alternative of an exploration program with tight governmental schedules (perhaps federally financed) instead of a lease auction.

There are a number of other feasible alternative scenarios that need to be examined. This examination is especially important given the crucial role of the "one for one substitution" assumption in the analysis of on-shore impact, since such an assumption carries rather profound implications for on-shore impacts, as well as for energy supply analyses.

Furthermore, the EIS virtually ignores the potential for significant conservation measures in the end uses of petroleum such as, for example, designing more energy efficient automobiles, the development of mass transit, the construction of better insulated buildings, alternate modes of space conditioning, etc. If a comprehensive energy conservation strategy were to be implemented simultaneously with oil and gas development, one barrel of oil from the continental shelf might in effect substitute for substantially more than one barrel of imported petroleum.

Alternately, in the absence of a coherent national policy regarding the nature and rate of utilization of petroleum and its products, it is possible that an ever-increasing drain on petroleum resources, both imported and domestic, would occur, with the result that a barrel of oil from the continental shelf would substitute for far less than one barrel of imported petroleum.

All this demonstrates that the potential policy of greatly increasing leasing on the continental shelf seems to be a knee-jerk decision, with no contingency planning of the alternatives that would have to be invoked if the implicit assumption of large resources is incorrect. Given the long lead times involved in developing energy technologies (for example, better ways to mine and use coal), such implicit assumptions about oil resources, if not accompanied by far better consideration of alternatives than is shown in this EIS, pose grave future risks for the citizens of the United States. This is probably the most serious deficiency in the entire EIS.

More specifically, the lease sale schedule mentioned on page 8 of volume I has been supplanted by a new tenative one (released on November 14, 1974); future editions of the programmatic EIS plus any other similar documents (regional or site-specific) should contain the most recent schedule available.

The section describing how the then current lease schedule was developed (v. I, p. 8-9) is very sketchy, so sketchy in fact that it is impossible for the reader to determine for himself and verify the assumptions regarding, e.g. "supply-demand imbalances." This section must be improved to meet the general comments immediately above regarding implicit assumptions and the absence of contingency plans.

In our copy, Figure 1 (mentioned on v. I, p. 9), is found on p. 174, and is not a lease schedule, but rather a map.

We are aware that study plans (v. I, p. 9-10) are also being developed for the mid-Atlantic. (To date, we have found them to be seriously deficient, though some improvement is discernible. See Attachment 1 to this testimony).

We believe, on p. 10, that Attachment H is the one refered to in the second paragraph.

We strongly endorse any initiative to make readily available to all interested parties the geological and geophysical information for areas designated for lease sales (v. I, p. 11). We hope that Interior and others will reach agreement on this issue in the near future, and that a description of how to obtain such data will be included in the next EIS edition.

We agree that, under current law, the Secretary has only two ways to offer leases. This is not a flexible enough armamentarium, but as the draft EIS notes (v. I, p. 12), the expansion to other alternatives probably requires new legislation.

We agree with the statement (v. I, p. 13) that the various "impacts (associated with continental shelf development) must be adequately portrayed." We sincerely wish this draft EIS did so, but unfortunately it does not, as our comments above and below demonstrate. We note here that several other states, the New England Regional Commission, and the Environmental Protection Agency have reached the same conclusion as to the general inadequacy of this draft EIS; we have earlier, by reference, incorporated those statements into our comments.

Again, events regarding leasing have outpaced the document (v. I, p. 14); presumably future editions will be as up-to-date as possible. In addition, though, we are very concerned about the possibility that many significant aspects of this issue may fall between the cracks of a programmatic EIS and a site-specific EIS. For this reason, and based on our preliminary evaluation of other EIS documents for Louisiana and the MAFLA region, we believe that serious consideration should be given to the preparation of regional impact statements; for example, one such regional statement could cover the Baltimore Canyon Trough region. Such a step would have several advantages, among them:

1) Allowing adequate attention to unique regional characteristics -- economic, cultural, biologic, etc.,

2) Allowing an evaluation of currently available energy-related facilities (pipeline networks, storage and refining capacity, etc.), and

3) Permitting a more adequate evaluation of the potential needs for and location of additional such facilities in a way that would, for example, minimize adverse environmental and economic impacts.

Such an analysis should be based on a set or matrix of alternative assumptions regarding quantities of oil and gas and alternative time courses for the development of those quantities.

We do not believe that a regional EIS should completely replace a site-specific EIS. But it is clear to us that regional impacts require more sophisticated analysis than the relatively straightforward tract-by-tract decisions.

It would be most useful if the basis for the USGS report which estimates recoverable resources was better described and, in particular, if information on the methodology used was included (v. I, p. 21). This is an uncertain and controversial area, and methodological questions are very important for anyone attempting to grapple with it. (See also our comments above on assumptions behind the document.) Similarly, the comments on future supply and demand (p. 22-23) are so sketchy as to be useless.

We presume that adequate analyses of the Council on Environmental Quality report plus other more recent materials from, e.g., the National Academy of Sciences and the Ford Foundation Energy Policy Project will be included in the next EIS edition. There is much information available from these and other sources that is not adequately reflected in the EIS.

We concur very strongly with the NOAA recommendations on p. 24-25 of volume I, and urge Interior to implement them as quickly as possible.

We sense generally, throughout the report, a disinterest in the data and information that might be available from other than federal agencies. Our state, for example, has extensive information related to the off-shore and especially near-shore and on-shore aspects of continental shelf activity. Attached to this testimony is a map containing a sample of such information; it would behoove the Department of the Interior to look more broadly and comprehensively for data from other governmental agencies as well as from the private sector. It is this lack of comprehensiveness that is one of the main reasons for the very serious technical deficiencies in the draft document as it now stands. For example, "resource reports" (v. I, p. 27), not just recommendations for tracts to be leased, could be solicited from all interested parties as away to build Interior's data base.

Section C (Description of OCS Oil and Gas Operations, v. I, p. 29-87) is one of the better sections of the report. It could profit (as could the entire report) from greater use of schematic diagrams, photos, charts, etc., as well as a clearer definition of some of the jargon of the field (see e.g., "wire line units" on p. 54, and the "bright spot" technique on p. 71). However, we strongly urge that the deficiencies of current containment techniques (p. 78) in areas such as the mid-Atlantic be emphasized in the final volume.

Section D (Other Management and Supervisory Aspects of the Program), on the other hand, is so full of jargon as to be virtually useless to the intelligent and interested layman (see, for example, v. I, p. 89-90 on pre-sale evaluation.) Without, for instance, some indication of the values used for discount rates, one is at a loss to arrive at an intelligent understanding of this phase of the system.

On v. I, p. 123, the complete list of relevant New Jersey statutes includes: Riparian statutes, N.J.S.A. (New Jersey Statutes Annotated) 12:3 and Pinelands Environmental Council, N.J.S.A. 13:18. The correct citations for the Coastal Wetlands statute is N.J.S.A. 13:9A, and for the Coastal Area Facility Review Act, N.J.S.A. 13:19.

The description of the environmental data collection programs (beginning on v. I, p. 126) is seriously incomplete. In New Jersey, as noted above, we are very concerned about both the adequacy and continuity of the benchmark/baseline/monitoring studies, (see Attachment 1), and firmly believe that a more thorough description of the entire array of environmental studies must be included in the final EIS. The description here is blatantly inadequate.

On pages 129-130 of volume I, we believe that a more thorough description of the on-going studies is required, preferably with information on results already published, who to contact for further information, etc.

The description of monitoring programs (v. I, p. 140) raises the possibility that a portion of the monitoring may cease after production begins. This is totally unacceptable, since it is precisely during the production phase that one reasonably expects the greatest chance for adverse biological (or even economic) effects. After all, the whole rationale for a baseline study is to establish a means to detect and judge the seriousness of any change during the production phase. If such monitoring is not continued through and after the production phase, there is absolutely no purpose in the earlier studies. We presume that this implication will be eliminated in subsequent editions.

II. Description of the Environment

We will confine our remarks only to the Atlantic and more specifically, the mid-Atlantic region, since that is our area of both greatest knowledge and greatest concern. However, our less intensive study of the parts of the EIS on other geographic areas suggest omissions and deficiencies for those other regions as serious as those for the Atlantic region.

We find no serious inaccuracies in the basic geologic information in the sections of particular interest to us. (v. I, p. 173-183; p. 195-201a; p. 558). However, there is additional information available which should be included, if not in the programmatic EIS, then in subsequent regional or site-specific documents. Attachment 2 is a brief report titled "Geology and Geography with Respect to the Development of Oil and Gas on the Continental Shelf Adjacent to New Jersey," prepared by the State Geologist. Also appended to this statement is a bathymetric map (referred to earlier) patterned after the Interior Department's own protraction diagrams. These materials include a variety of additional geological and other types of information.

While we can find no major fault with the sections on climate and physical oceanography, (v.I, p. 207-237), we do suggest that the judicious use of charts, graphs, etc. could present much of this information in a more efficient and more easily used form. On a related point, care should be taken that charts, maps, etc. are reproduced clearly and legibly. (See, e.g., Figure 18 on p. 218 of v.I.).

The offshore biological section (v.I, p. 237-263) is seriously deficient in a variety of areas. Rather than re-state the criticism of others, let us merely affirm that we endorse both the general and specific comments on this area incorporated by reference earlier in this statement. In particular, we agree completely with the comments submitted by the Commonwealth of Virginia on this section.

In addition, the charting of comparative figures for, e.g., primary productivity, commercial fish catches, etc. for the various regions, including the Gulf, would be most useful. In particular, we believe that the Atlantic fishery generally is capable of providing a larger sustained yield of fish protein, both per unit area and in the aggregate, than the Gulf. Such comparisons should be properly displayed in a thorough EIS. A mere "ranking by weight of catch" (e.g., v.I, p. 256) is clearly not adequate. (By the way, lobsters and scallops are harvested off New Jersey; there is no mention of either one.)

The specific mistakes in this section, discussed by the Commonwealth of Virginia and others, are too numerous to set down in writing without our undertaking to draft a completely new section. Nonetheless, we cannot resist citing one example. On p. 249, Spisula solidissma is identified as a polychaete, and on p. 251 as the surf clam. The second identification is the correct one. This section obviously needs a good deal of editorial work in addition to substantial revisions in its content.

The same general comments above on off-shore geology apply to the brief section on the near-shore and coastal geology (p. 558); the report attached to this statement (Attachment 2) should prove to be particularly useful here.

The same general comments on the biological environment made above by us and by others apply to the too-brief section on the biological environment of the Atlantic coastal zone. In addition, given the ecological as well as the direct and indirect economic resources of the coastal zone, we believe that this section should be given much more prominence. It is a virtual certainty that the adverse effects that may follow from continental shelf development will most seriously affect the coastal zone. This demonstrates the importance with which this topic should be treated.

The two sections on land use in New Jersey (v.I, p. 597-605) do not do justice to the distinct regional characteristics of the different areas of our state; neither do they emphasize which areas are or could be useful in the support of the various phases of continental shelf development. We note that, as part of the Department of Environmental Protection's implementation of the state's Coastal Area Facility Review Act, a comprehensive environmental inventory for the great bulk of the coastal zone of New Jersey is being carried out at this time. Interior Department personnel would do well to avail themselves of this on-going work, plus related work by other state agencies, before revising the EIS and especially before the preparation of a regional statement.

In addition, we note that the coverage of different geographical areas is spotty. For example, state laws are described for some states (e.g., North Carolina, v.I, p. 611) but not for others (e.g., New Jersey). Such inconsistencies and incompleteness should be remedied.

It is a bit ludicrous that the only description of existing or potential Maryland ports is "The Port of Baltimore is similar to a long stemmed 'Y' in shape"! (v.I, p. 657). In general, the port section should be expanded to provide more data on existing ports, including information on areas where channels could be deepened to accommodate larger vessels, areas where new navigational systems are being installed (e.g., the New York Harbor), and even information as to which existing or potential port facilities could, on technical grounds, be used as support bases for offshore development. This, along with the section on railroads, highways and airlines, is probably one of the most deficient in the entire document, especially in view of the readily available information on these topics, and the absolute importance that this sort of infrastructure would play in the support of continental shelf development.

Almost the entire section on commercial fisheries (v.I, p.663ff) could be condensed into a table; this would be much more useable than the current format. In addition, we believe it should be possible to estimate the potential future value of the commercial fisheries. It is likely that in the years ahead this protein source will become even more important than it is now. A distinction should be drawn between the near-shore and deep-water fisheries, and the neglect of the economic (not to mention recreational) importance of sport fishing activity is a serious deficiency.

Our earlier comments on the oil and gas estimates in Part I are equally valid for v.I, p. 676. (It is strange, to say the least, to see such a fundamental topic as the estimation of potential energy resources to be treated in as meager a way as it is here and in other portions of the document).

Given the draft's sketchiness on vital economic matters, it seems pointless to comment in depth on p. 678-681 of volume I. However, it would seem appropriate to focus specific attention on the economic aspects of energy needs in this region, as well as on the existing energy-related industries. The Delaware River, for example, is already a major entry point for oil; it has along its shores extensive refinery capacity (approximately 1 million barrels a day) as well as a large complex which uses petroleum products as feedstocks. It is incomprehensible to us why the draft document does not address these topics at all. It seems as though the concept of analyzing on a "fuel cycle" basis (i.e., from the oil in the ground to the point of final use, with attention to all steps in between) is beyond the grasp of those who prepared the document. In our view, it is mandatory that a document purporting to be a programmatic statement undertake this sort of analysis, including, but of course not limited to, the economic aspects of the fuel cycle.

Rather than re-write the brief sections on water quality in waterways adjacent to New Jersey, (v.I, p. 695-6), we will merely note that far more complete and even more recent information is available from us, from EPA, and from others. In addition, we believe the topic of ocean dumping deserves more attention than the few brief words devoted to it in this section.

III. Environmental Impacts of the Proposed Action

The first several pages of this section (v. II, p. 157-161) are so inadequate and confusing, even as an introduction, that it is difficult to know where to begin with comments. We will confine ourselves only to a few observations:

1) It is not clear whether "spill" implies only large catastrophic spills, small "normal" spills, or both. In our opinion, over the long run the second type is far more important in its biological effects, but, in any event, the two should be clearly distinguished.

2) We agree that existing data on this general area is seriously deficient. However, it is not so deficient as to allow no predictions at all. (See the next point.)

3) The lack of attention in the document to the potential rate of development and also to whether offshore supplies would substitute for imports is apparent here. These two factors will very significantly affect the type, degree and time course of all impacts on living and non-living things.

4) We are not convinced by the non-data in the document or by any other data we have seen that the "catch per unit effort" in the Gulf of Mexico has increased over the last 25 years.

5) We do not understand what a "sublethal description" is (v. II, p. 159).

6) We are not convinced that pipeline burial is the "second most severe impact," though the inclusion of data might so convince us.

This list could be extended considerably but, in the interests of saving space, we will merely re-state our agreement with the related points made by those whose comments we have previously incorporated by reference.

Many others have already noted that the section on land-use and socio-economic effects (v. II, p. 219-249) is clearly inadequate in content and scope; we strongly concur with this view. A much more thorough analysis of the impacts over time of different development scenarios, assuming different resource bases, is mandatory. We note that some other analyses we have heard about conducted by the federal government suggest a much less significant employment impact, for example, than those cited in the draft statement. In addition, preliminary analyses undertaken by the consultant for the Office of Technology Assessment's study on off-shore energy sources lead to a similar conclusion. This is an area which deserves much more thorough attention here, as well as in subsequent regional and site-specific statements.

The summary section (v. II, p. 250ff) repeats the earlier mistake of paying too little attention to the effect of chronic, low-level discharges, especially as such contamination might affect bays, estuaries and wetlands.

IV. Mitigating Measures Included in the Proposed Action

Generally this is a useful summary, as far as it goes. But it omits any discussion of the most general and also most effective measure; namely, guiding the time course and rate of development of any resources which may be present.

V. Unavoidable Adverse Environmental Impacts

Much of this section repeats earlier materials without contributing to better understanding of them. The attention given to secondary land use impacts is clearly deficient. We do not understand the statement that deepwater ports "will be almost necessary in the future;" that reminds us of the phrase "a little bit pregnant."

VI. Relationship Between Local Short-Term Use and Maintenance and Enhancement of Long-Term Productivity

Much of the material here repeats information in earlier sections, and should be eliminated here. Specific attention should be given to the impact of on-shore support facilities and their impact on the long-term productivity of existing or potential biologic and/or economic resources (e.g., tourism). Finally, there should be some discussion of the institutional mechanisms for insuring the conversion, rehabilitation, or removal of the facilities supporting oil and gas development when the facilities have served their use, including both off-shore platforms and on-shore facilities, and for fully restoring navigation lanes and fishing zones, as well as for rehabilitating the land.

VII. Irreversible and Irretrievable Commitment of Resources

We were gratified to see at last some explicit recognition that decisions regarding continental shelf leasing have a direct connection with longer-term energy policy considerations, though the recognition is of a very limited sort (v. II, p. 321):

> "With this commitment of more easily obtained oil and gas, development of secondary and tertiary recovery technology is delayed. Unless incentives are developed for research into these technologies, a more dramatic crisis of energy supply may occur in the longer term."

We certainly agree with this statement, but it is by no means broad enough. If, as we suggested in the opening paragraphs of our statement, federal energy planners are counting on significant energy reserves under the continental shelf, and if they are wrong in that assumption, then it is virtually certain that a "dramatic crisis in energy supply will occur in the longer term." This and the related factors that we outlined in our opening paragraphs are pertinent to this section as well, e.g., "the increased production....will....replace imported crude oil and natural gas" (v. II. p. 322). We are as troubled by their appearance in this section as we were by their appearance in the opening pages of the EIS.

VIII. Alternatives to the Proposed Action

This section contains much useful information; but, as others have already pointed out, it is not sufficiently thorough or well reasoned to justify the policy decision it purports to support. In particular, there are several other leasing alternatives that should be carefully analyzed and evaluated.

Even more fundamentally, this is the section where the proposed policy of accelerated leasing should be presented in the context of a coherent and comprehensive national energy policy for both supply and demand, including contingency plans. As we have noted before, this is absent from the entire document, and is, in our view, the most serious single deficiency in a very deficient document.

In the early part of this statement, we outlined only a few of the many alternatives that must be analyzed if the proposed development of potential off-shore oil and gas resources is to be carried out both in accord with the Interior Department's stated goals and to aid the broader national interest. This draft EIS is virtually devoid of such analyses, and therefore, virtually useless as a justification of the proposed leasing policy. In our view, it would be a waste of time to try to patch up the current draft. A far wiser course would be to start a new on completely new version.

February 10, 1975

ATTACHMENT

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
TRENTON 08625
OFFICE OF THE COMMISSIONER

January 2, 1975

Mr. Frank Basile, Leader,
  Environmental Assessment Team
Atlantic OCS Office, Bureau of
  Land Management
Department of the Interior
90 Church St.
New York, N.Y.   10007

Dear Mr. Basile:

We have carefully reviewed the most recent outline for the proposed baseline study for the mid-Atlantic region ("Outline #2"), which you submitted to us by letter dated December 23rd, as well as earlier materials pertinent to this scientific effort. The purpose of this letter is to put in writing our general views on the research program you are planning for 1975 in advance of the meeting on January 3rd, where these plans will be discussed further. Below are our general comments; more detailed suggestions will be sent to you within a few days, consistent with the very short timetable for comments from interested States which you outlined at the meeting in New York on December 17th.

Our view is that the so-called "baseline studies" as currently proposed by the Bureau of Land Management suffer from two fundamental constraints: too little time and too little money is being made available to do an adequate job. These constraints are so serious that, in our opinion, the resulting studies will be at best feeble, and at worst, futile efforts when judged by the goals and objectives for these studies. As stated by the Bureau, one of the fundamental objectives of its study program is to provide the "basis for predicting the impact of oil and gas exploration and development on the marine environment." The baseline studies are the first step in meeting this objective. It is therefore very disturbing to find this first step so flawed. In particular, it is essential that it be possible to design subsequent monitoring efforts to ensure that exploitation of the nonrenewable energy resources is not carried out in such a way that the continued productivity of the renewable biological resources is threatened. In addition, sound baseline data (especially physical data) is mandatory for the sorts of predictive studies that will be required to minimize

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
TRENTON 08625
OFFICE OF THE COMMISSIONER

January 10, 1975

Mr. Frank M. Basile
Bureau of Land Management
Atlantic Outer Continental Shelf Office
90 Church Street, Room 1305
New York, New York 10007

Dear Mr. Basile:

Here are our promised comments on the proposed Mid-Atlantic OCS baseline study program. As you will note, we have placed our specific comments in the rubric of your most recent outline (No. 2), which preceeded the January 3rd meeting.

As our general statement here and our previous letters should make clear, our participation at this stage of the project does not imply agreement with Interior's approach to the management of the public's natural resources on the continental shelf. We wish to make clear also, nevertheless, that you and your staff have handled your often difficult task with commendable patience and courtesy.

Sincerely,

William S. Maddux　　Glenn Paulson

William Maddux, Ph. D.,
Principal Biologist

Glenn Paulson, Ph. D.,
Assistant Commissioner
for Science

WM/GP/mdc

cc: Commissioner David J. Bardin
Attendees at January 3rd meeting

100% Recycled

the possibility of catastrophic effects, particularly on-shore, of off-shore activities. The studies, as currently planned, will not allow these goals to be met.

More specifically, the proposed study period of approximately one year (or possibly less) for actual data gathering before leasing is entirely too short a period to gather meaningful information. The term "environmental impact" has meaning only in relation to living systems: truly useful baseline data (physical, chemical and biological) pertinent to these living systems cannot be obtained adequately in the time currently allocated for this study. In fact, it appears to us that the timetable for the baseline study seems to be shaped primarily by the current leasing schedule rather than by any attempt to do a thorough and professional study. Living systems go through cyclic processes; sound baseline data must be gathered on a time scale roughly commensurate with these cycles. At the minimum, this would require a full year of field work, not including start-up time and data analysis. Even then, for many categories of organisms, field data over one year cannot possibly yield more than one datum point; this obviously does not provide "baseline" data in a true sense. Fundamentally, a one-year study cannot provide information on the annual variance for many key factors; without adequate estimators of such variance, there will be no sound way to compare subsequent measurements with the baseline data in order to detect trends early enough to take appropriate corrective actions.

In short, the proposed studies are patently insufficient for sampling many of the biological variables of concern. Similar deficiencies are also apparent in the plans for monitoring many of the physical variables to be measured.

In addition, the proposed funding level of $3 million appears to us insufficient to provide reasonably complete information, even if more time were available. The physical studies alone, involving, e.g., the placement and maintenance of current meters and monitoring buoys for at least a year, plus other measurements which require the extensive and expensive use of surface and aircraft could easily use up the entire amount just to obtain a reasonably clear and useful picture of the region's water movement patterns. The goal of the chemical work is to provide thorough information on the hydrocarbon and metal content in the waters, organism and sediments of the region. To gather and analyze the samples needed to meet this goal could again easily consume the entire funds available, given an analysis cost of perhaps $200-300 per sample, needed replications, plus of course ship time, data handling costs, etc.

From another perspective, the comparison between the proposed funding for these fundamental studies, and the potential revenues from actual exploitation of the resources shows how meager the proposed funding is. Using BLM figures for the estimated cost of oil production, current oil prices, and an assumed production rate of 400,000 barrels of oil per day, less than one percent of just one year's revenue is to be spent to obtain the fundamental baseline information without which it will be impossible to determine the kinds or even the presence of the environmental impacts that may result from OCS activity. Such a gross discrepancy between the funds allocated for these studies and the potential value of the resources does not reflect adequate attention to managing the OCS region in the broad interests of the public at large.

As we stated earlier, we will provide additional more detailed comments to you within the next few days. But in our view, the only value in these additional comments may be to make a very inadequate study plan only somewhat less inadequate, since the constraints of limited time and money virtually guarantee a technically deficient final result for the baseline study effort as currently planned.

Sincerely,

Glenn Paulson
Glenn Paulson, Ph.D.
Assistant Commissioner
for Science

William Maddux
William Maddux, Ph.D.
Principal Biologist

GP:WM:cs

GENERAL STATEMENT

One of our major criticismsof the proposed OCS baseline program is the short time allotted for it. We think that every effort should be made to use the period between leasing and full production as a continuation of the baseline period for study purposes. This would require provisions for continuity of the research effort and its supervision through the management transition from BLM to Geological Survey responsibility.

Even, or especially, after production is fully underway monitoring would be more effective if similar continuity were provided for. What is required is continued supervision by a technically competent staff or group with stronger than advisory power to compel the concordance of exploitation activities with the public's interest.

Monitoring observations can only be evaluated in relation to prior conditions and the significance or lack of significance of observed variations can best be estimated by persons familiar with the entire data series. Also, an adaptive strategy is likely to be much more effective. Sampling plans should be revised as potential problem areas are identified. Local studies should be made as specific drilling and pipeline locations become known. The nature and amounts of formation waters may dictate special attention to certain chemical or physiological studies.

There has been much concern for "chronic" effects which cannot yet be identified or specified. If such effects exist they will only begin to be evidenced fairly late in the exploitation process, which again emphasizes the need for continuity of the environmental impact scrutiny.

A unitary, continuous, supervision of the environmental assessment process is required both for prevention efforts and to assure timely intervention if undesirable trends or effects become evident at any time during or after the projected activity.

As one of the states most likely to suffer the ill effects which OCS exploitation may cause, we believe that New Jersey has a right and obligation to participate in such a "watchdog" function.

SPECIAL COMMENT ON "ARCHIVING"

It is difficult to overemphasize the importance of collecting and carefully storing adequate samples of bottom sediments, suspended particles, and floating or surface associated materials, as well as organisms. Although it is vital that this be done comprehensively, not only by representative or "indicator" sampling but exhaustively, it is also vital that this program not be used to postpone effort in analyzing the initial collections.

The storage program is important because there is reason to believe that as more information is gained in the future our analytical capacity will increase both technologically and conceptually. This is especially likely to be true for potential "chronic" effects.

As was brought out on January 3 by Dr. Monastero, at this time there does not appear to be any existing facility on the East Coast capable of accommodating such archived samples, nor is there even agreement on how samples should be handled (temperature, pre-preparation, etc.) to best preserve them for various modes of analysis. This is a very important problem area. We believe it is the responsibility of BLM or perhaps more generally the Department of the Interior to provide the resources needed to create and operate such a facility.

RESPONSE TO OUTLINE No. 2

1. Marine Geology

   1. Here the vertical interface movement baseline studies should be augmented by studies in specific selected site areas as these become known. Use should be made of fixed reference structures as they become available.

   2. Collections of sediments should involve samples large enough for archiving and to permit special studies of oil uptake and release, etc. For such studies, preservation methods should be carefully examined to maintain the pre-existing physico-chemical state of associated heavy metals, ion exchange potential, etc. as much as possible.

   3. The quantitative efficacy of tracer sediment studies appears highly suspect. Therefore, this should be assigned low priority.

   4. Because of likely large variations of these observables over time, special care should be taken in the design of the sampling scheme for this portion of the study, if any scientific utility is to be served.

RESPONSE TO OUTLINE No. 2 (Continued)

II. Physical Oceanography

1. The placing of too many eggs in the "current meter string" basket seems ill advised. Within the proposed study constraints, the wiser course would be to put major effort into the empirical "La Grangian" approach with drifters, dye-movement observations, etc.

   This comment is not intended to apply to the bottom current measurements associated with studies of sediment transport carried out to develop precise data on, e.g., specific sites.

2. Nearshore bottom and surface metering efforts would be more likely to result in useful data than would the attempt to describe the entire flow field of the leasing area by the current meter string approach.

3. See Comment II. 1. above.

4. This seems reasonable to us, except for the fact that the exact locations of lease sites, etc., are not yet known.

5. See Comment II. 4. immediately above.

6. When this was discussed at January 3 meeting, existing models were questioned as giving predictions inconsistent with empirical drifter studies. There appears to be much reason to question if, within present study constraints, much effort should be spent on this. See Comment II. 1. above.

7. Here again, this is something to be considered specifically for individual sites. The area is simply too large to cover in detail.

8. This also seems reasonable to us.

III. Marine Chemistry

1. Archiving will be very important here; see our separate comment.

2. Same as III. 1.

3. As in III. 1. and I. 2.

RESPONSE TO OUTLINE No. 2 (Continued)

III. Marine Chemistry (Continued)

4. Sample preparation and archiving also is vitally important here. The nature of associations, binding, chelation, etc. will be very important, as will be consideration of possible partitioning of metals present between original associations and petroleum or other introduced materials (e.g., drill muds may contain materials with active surface exchange properties).

5. This is reasonable.

IV. Biology

At this point rather than make itemized comment on outline No. 2 we would prefer to say that we consider the statement provided on January 3 by Dr. Donald F. Boesch of Virginia Institute of Marine Science to be an excellent analysis of the problem; it expresses our opinions in a substantial and complete manner. Again, the issues of continuity and archiving are of fundamental importance; see our general statement.

WM/GP/mdc

ATTACHMENT 2.

GEOLOGY AND GEOGRAPHY WITH RESPECT TO THE DEVELOPMENT OF OIL AND GAS ON THE OUTER CONTINENTAL SHELF ADJACENT TO NEW JERSEY

General Geology

New Jersey is the emerged portion of the Coastal Plain whose submerged portion is known as the Continental Shelf. This is a prism of Cretaceous, Tertiary, and Pleistocene sediments which forms seaward from its northwestward edge along the Delaware River below Trenton and along a general line from Trenton to New Brunswick where it overlies Precambrian and Triassic rocks. There is an interpretation that there are younger Jurassic rocks under part of the Outer Continental Shelf. The base of this prism of sediments has a uniform dip seaward at about 80' per mile. In the vicinity of the Delaware River south of Trenton the prism has a thickness of 100 to 300'. Geophysical evidence indicates that some 30,000' of sediments form this prism in the "Baltimore Canyon Area" 45 miles southeast of Island Beach.

These sediments have a geologic history of alternating emergence and submergence from Cretaceous time about sixty million years ago. The lowermost formation under New Jersey, the Raritan, was formed by streams flowing across a Coastal Plain not far from the ocean at that time (the Raritan under the Continental Shelf is believed to be composed of marine sediments.) Under the Outer Continental Shelf this apparently covers even older Cretaceous sediments which are probably marine and which resemble the Gulf Coast oil producing formations. Above the Raritan Formation are various deep see marine greensand marls and other marine formations. The top of this pile of "sandwich" is the Cohansey Formation which formed under conditions similar to the underlying Raritan, but the ancient shoreline was a little west (inland) from our present shore, as indicated by stream and beach placers which are being worked for ilmenite in the vicinity of Lakehurst and Lakewood.

Early geophysical surveys across this prism of sediments by Ewing and Woolard (Geol.Soc.Amer.Bull.Vol.50,pp.257-296, 1939) suggested that in the area of the Outer Continental Shelf the underlying formations may curve upward or at least are more complex than the uniformly dipping strata underlying New Jersey.

Recent geophysical data, which we have not yet seen, apparently suggest the presence of the geologic structures necessary for the formation of gas and oil pools. Interpretations range from faults and anticlines through salt domes. We have been advised, however, that the possible salt domes are beyond the Continental Shelf on the Continental slope. Geophysical and New Jersey well data indicate that there are formation pinch-outs which could also serve as structures for the accumulation of gas and oil.

During the last million years the Continental Shelf and New Jersey have suffered several major changes in sea level. Yellow gravels now forming high points in the Coastal Plain were laid down during interglacial periods of higher sea level, while during the maximum advances of the ice sheets (there were four which reached or probably reached New Jersey) sea level was much lower than at present and formed at least two wave-cut cliffs and associated beaches on the Continental Shelf of New Jersey. Also during this period the ancestral Hudson River formed a delta near Sandy Hook and further out eroded a deep canyon back from the outer edge of the Continental Shelf. (The Baltimore Canyon Trough is a geologic feature with a thick section of sediments in a downwarped portion of the basement; this should not be confused with the Baltimore Canyon, smaller but similar to the above described Hudson Canyon.)

Because of this geological history, grab samples and shallow test holes on the Continental Shelf are Pleistocene in age. There are, in addition to the shorelines described above, beach ridges, extensive sand dune deposits, and other features similar to those found on the emerged New Jersey Coastal Plain. The bottom conditions upon which the various biologic activities of the ocean bottom take place therefore will range from hard clay bottom through silt and sand to coarse gravels. Recent studies suggest that in some areas there are moving sand ridges or sand waves which make an unstable bottom perhaps 30' to 50' thick.

We may summarize the above by saying that for the last sixty million years sediments have been accumulating in the area which is now the New Jersey Coastal Plain and the adjacent Continental Shelf. Some of the sediments have been deposited in the deep sea; at other times the area has been subject to erosion. The effects of glaciation in the Pleistocene have created several unique features on the submerged Coastal Plain but all others correspond to those found in the New Jersey Coastal Plain or along our present shoreline. Our shoreline today is the result of a slight emergence of New Jersey from an earlier period of submergence indicated by the drowned valleys of the Hudson and Delaware.

The exact structure of the sediments in the Outer Continental Shelf and in the so-called Baltimore Canyon Trough is not precisely known but some structures have been deduced from interpretations of various geophysical profiles.

The age of the deeper sediments and the interpretations of geophysics strongly suggest that the conditions necessary for oil and gas pools are present.

Is There Oil?

Statistical analysis of the age, geologic history, and possible structures of this prism of sediments as compared to the analysis of similar prisms of sediments of equivalent age elsewhere in the world where oil and gas have been found suggest that there is every probability of such oil in the deeper part of this Coastal Plain prism. Geophysics, while permitting the interpretation of the structures, does not tell us whether oil or gas are present. Until the structures are drilled no one knows whether or not oil or gas are present. Therefore, estimates of yield are subjective and speculative judgments.

It should be further noted that the 125 wells which have now been completed in Sable Island area off Nova Scotia have revealed several small pools of oil and gas, but none individually or collectively are large enough to justify pipelines or the establishment of development facilities. The work continues on the hope that this will eventually reveal oil and gas pools of sufficient size to warrant exploitation. So far, wildcat wells off Florida have been dry holes. Finally, although attempts have been made to find oil and gas in the New Jersey Coastal Plain, there has been no indication of oil or gas occurrence in this prism of sediments, neither have any deep water wells revealed traces of oil or gas.

Geologic Hazards

Before discussing specific geologic hazards it should be emphasized that the geologic conditions in each of the Continental Shelf areas off the United States are different from each other and are different from conditions in foreign fields. There is no comparison, for example, between conditions in the North Sea and those off New Jersey. Off New Jersey there is the possibility of earthquakes, there are some restricted areas where mud slides may occur, there are some areas with shifting bottom or sand waves, and, depending on what exploratory borings develop, there could conceivably be high pressures in some of the drill holes.

Earthquakes

There are no recorded earthquakes in the New York Bight area which have resulted in so-called tidal waves, nor have there been any earthquakes in the New Jersey area with an intensity on the modified Mercalli scale greater than VII. Such an earthquake at sea could be expected to result in noticeable tidal effects on the New Jersey shore, but such have not been reported.

Mud Slides

This is an unknown quantity that might occur, particularly with an earthquake on the sides of the Hudson Canyon along a Pleistocene shoreline or those occasional places on the sea bottom where there is a comparatively steep slope or bank. Most of the Continental Shelf, however, has slopes of less than 1° and, therefore, mud slides should not occur.

Sand Waves

Some studies indicate that sand waves and shifting bottom occur, while other studies indicate stable and unchanging bottoms. Up to depths beyond which the effect of storm waves is not felt on the bottom (most of the Continental Shelf) movement of the bottom sediments, particularly the upper few feet, is to be expected in cases of severe storms. This hazard could, however, be compensated for with adequately designed platform foundations. Similar designs would also compensate for sand wave conditions up to 20 or 30'. Preliminary exploration and testing of specific platform sites is required because of the general lack of information. A pipeline from a platform in such an area would have to be buried below the bottom of the moving sand.

Deep Hole Pressures

Some individuals and agencies are concerned with the possibility of deep hole pressures, a cause of the Santa Barbara blowout. In general, oil fields adjacent to salt dome intrusions and in some types of anticlinal fold structures have higher gas pressures than other types of structures. Whether or not this should be a concern will depend on the nature of the oil structures revealed by the test and exploratory development.

Shorelines

It is axiomatic that the beach, the dune areas, and the submerged bottom in shallow water in front of the beach, particularly in the zone of the breakers, will be in general movement and may change location and configuration in major storms. There are, however, ways to design and locate pipelines to minimize storm damage. North of Barnegat Inlet for example there are numerous sewer outfalls which extend at least 1000' seaward, well beyond the breaker zone.

Information Sources:

Attached hereto is a geologic cross-section and a map of New Jersey and the Continental Shelf at a scale of 1:250,000. There is no vertical exaggeration in the geologic cross-section. The map shows the factors that the Council of Environmental Quality considers necessary when evaluating the impact of oil and gas wells off the New Jersey coast. The Bureau of Geology and Topography has about 70,000 well records for New Jersey, an Earthquake pamphlet which is kept up to date, and other geologic and geographic information which may be useful in preparing environmental impact statements.

ATTACHMENT 3.

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
TRENTON 08625
OFFICE OF THE COMMISSIONER

ADMINISTRATIVE ORDER NUMBER THIRTEEN

By virtue of the authority vested in me by the provisions of N.J.S.A. 13:1B-3, as amended, and 13:1D-1 et seq., I do hereby order and declare:

There is created within the Department of Environmental Protection the Offshore Oil and Gas Task Force which will be responsible for advising the Commissioner on policy relating to offshore oil and gas exploration and production.

The following personnel are assigned to the Task Force:

Mr. Harold Barker
Mr. Karl Birns
Mr. Walt Dryla
Mr. Don Graham
Mr. Tom O'Neill
Dr. Ralph Pasceri
Mr. Bruce Pyle
Mr. John Serkies
Dr. Kemble Widmer
Dr. Glenn Paulson, Assistant Commissioner

Mr. Mark Reifer (added 1-17-75)

Dr. Paulson will act as Chairman of the Task Force, and Tom O'Neill as Vice Chairman.

Dr. Kemble Widmer will represent me, the Governor's designated nominee, on the Outer Continental Shelf Research Management Advisory Board. Dr. Widmer will attend Board meetings and report Board proceedings to the Task Force.

This Order is effective immediately.

David J. Bardin
David J. Bardin
Commissioner

August 28, 1974

State of New Jersey

The State's Department of Environmental Protection coordinated a task force which reviewed the draft EIS. A thoughtful, well-reasoned document has been presented to the Department of the Interior for its consideration in preparation of a final EIS. The task force acknowledged that its review was aided by four other reviews that were available to it (page 2). These reviews have been individually addressed elsewhere in this section on Consultation and Coordination With Others, and only the original issues raised by the State will be addressed below. Reference to specific comments will cite the page numbers found on the original material submitted by the State, not the EIS page numbers that have been added.

Disposition

The State begins by questioning three assumptions made in the draft EIS. First, the enhancement of prospects, while not translating directly into increased supplies, is perforce the first step in delineating the extent of reserves and the estimation of producibility. At that point, the USGS takes the available data on producibilty and determines a maximum efficient rate of production. This is a logical progression from the enhancement of prospects that ensues from exploratory drilling. If OCS prospects do not develop into increased supplies, then some combination of conservation, alternative domestic supply of fuel, or increased imports must result.

The simplicity of the second assumption on backing out imports may obscure its significance. Under either increased or decreased consumption scenarios, oil will still be a necessary commodity. To whatever degree domestic production increases, our dependence on foreign imports will be reduced by a like amount. Although imports may very well rise, they will not rise to the degree they would have had we not increased domestic production. The three scenarios presented by the State relate to economic considerations that are not within the scope of environmental assessment.

Increased leasing is at present the only method of increasing our knowledge of reserves on the OCS. Diligence in development must be enforced by the Federal Government to prevent the possibility of hoarding mentioned. Several alternative leasing and development strategies are presented in Section VIII.

Page 5, last para. - Conservation as a strategy of energy utilization and long range planning is also discussed at the beginning of Section VIII.
Page 6, para. 3 - New estimates from the USGS are used in this EIS. The estimates are much lower than USGS has previously reported, and make development of alternative sources all the more imperative, if they indeed turn out to be correct. The remainder of page 6 contains editorial changes; the current tentative sale schedule is found on Page 2. New geological and geophysical information disclosure requirements have been proposed by USGS (Federal Register, April 22, 1975).
Page 7 - Most of the material on this page relates to the State's

recommendation that regional EISs be prepared for frontier areas, but should not supplant site-specific EISs. This possibility is being actively considered by the Department, although generally the first EIS in a region looks at the implications of development in the entire region.

Page 7, last para. - The background information and methodology used in preparation of the USGS estimates may be found in Geological Survey Circular 725, prepared for FEA.

Page 8, para. 5 - The deficiencies of current containment equipment, and its inability to work in high seas, are highlighted.

Page 9, para. 2 - The description of environmental studies has been updated and expanded. Farther on, it is the fact that production has begun, that puts the studies program into a monitoring mode.

Section II on Description of the Environment has been substantially revised and edited; the comments of the State of Virginia later in this section should be consulted, since the State of New Jersey endorses and reiterates them.

Section III on Impacts has been thoroughly redone to incorporate a resources (renewable) summary, a natural hazard risk analysis, and an expanded discussion of generic impacts, both environmental and socio-economic.

Section IV now discusses timing, as does Section VIII.

Section VII allows a firmer definition of what was intended by the one-for-one replacement; any increased domestic production would replace imported oil.

Section VIII, and indeed the entire document, is not intended to be a formulation of National energy policy. The question being asked in this EIS is roughly, what are the environmental impacts associated with proceding with an expanded OCS leasing program, in what sequence and in what time frame should additional, site-specific analyses be performed on specific proposals, and what are the alternatives to such action. The development of a National Energy Strategy goes far beyond a consideration of OCS oil and gas.

Finally, the final EIS is felt to be an adequate document under NEPA for addressing the proposal. An EIS is never supposed to become a justification of the proposal.

Pages 934 through 936 are missing due to a pagination error.

STATE OF NEW YORK
DEPARTMENT OF LAW
TWO WORLD TRADE CENTER
NEW YORK, N.Y. 10047
TELEPHONE: 212-488-7567

LOUIS J. LEFKOWITZ
ATTORNEY GENERAL

PHILIP WEINBERG
ASSISTANT ATTORNEY GENERAL
IN CHARGE OF
ENVIRONMENTAL PROTECTION
BUREAU

February 24, 1975

Director (732)
Bureau of Land Management
U.S. Department of the Interior
Washington, D.C. 20240

Re: DES 74-90

Dear Sir:

Enclosed is an original and one copy of our complete comments on the Draft Environmental Statement. The comments are essentially the same as those delivered at Trenton, New Jersey, on February 13. We have added a new paragraph to the section on possible alternative leasing procedures and have slightly modified some of the other sections. Please accept the enclosed rather than the February 13 statement as our definitive comments on the DES.

We would appreciate knowing whether the Department has a tentative timetable for the completion of a Final Environmental Impact Statement.

Very truly yours,

LOUIS J. LEFKOWITZ
Attorney General
By

James P. Corcoran

JAMES P. CORCORAN
Assistant Attorney General

JPC:rab
Enc.

U.S. DEPARTMENT OF THE INTERIOR HEARING ON THE ENVIRONMENTAL IMPACT OF PROPOSED INCREASE IN ACREAGE FOR OUTER CONTINENTAL SHELF LEASING

FINAL COMMENTS OF NEW YORK STATE ATTORNEY GENERAL LOUIS J. LEFKOWITZ

February 24, 1975

P.O. & Office Address
Two World Trade Center
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PHILIP WEINBERG
JAMES P. CORCORAN
Assistant Attorney General
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PETER HUNT
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U.S. DEPARTMENT OF THE INTERIOR HEARING ON THE ENVIRONMENTAL IMPACT OF PROPOSED INCREASE IN ACREAGE FOR OUTER CONTINENTAL SHELF LEASING

FINAL COMMENTS OF NEW YORK STATE ATTORNEY GENERAL LOUIS J. LEFKOWITZ

The issue of OCS development poses great difficulties for concerned citizens and public officials because of the seeming conflict between the development of needed energy resources and the protection of our environment. Whether the development of these energy resources is absolutely necessary, and whether the adverse environmental effects of such development can be avoided, are issues that must receive the most detailed and careful analysis. We would now like to point out what we consider the most essential factors in any proposal for an increase in OCS development, factors which were inadequately treated in the DES.

Our summary comments fall into four general categories: General Policy, Analysis of Alternatives, Socio-Economic Factors, and Methodology.

I. GENERAL POLICY

A. Lack of A National Energy Policy

The need for additional OCS oil and gas must be determined in the context of a specific national energy program.

Although it is conceded that the nation's consumption of oil is expected to increase in the foreseeable future and that our dependence on foreign oil is also increasing, it does not necessarily follow that the only solution, or even the best solution, is the acceleration of domestic oil and gas development. While such a course may cut down on imports for several years, it will eventually leave us with no substantial reserves to be used in the future. We are satisfying an immediate thirst by drinking our last drops of water. What happens when the water is all gone?

It is essential that the energy resources of the U.S. be identified, and that a long-term development policy be established to assure the most beneficial exploitation and utilization of these resources, taking into account not only the needs of our present citizens but those of posterity as well. After careful study, it may be decided that our OCS resources should be identified and quantified but held as a strategic reserve against future emergencies rather than consumed immediately.

To attempt to gobble up the resources of the OCS as fast as possible and without reference to a definite national energy program is irresponsible and not in the national interest. We, therefore, urge that such a detailed program be put forth by the Administration and integrated into the Final Environmental Impact Statement.

B. State Participation in Decision-Making

States must be given a greater role in decision-making affecting development of the OCS. State governments have a legal responsibility to protect their marine and onshore resources and cannot do their jobs properly if decisions are made affecting their vital interests without consultation and participation.

C. Strict Liability of Lease Holders

In order to insure protection of the States' interest in their coastal resources, the OCS lessees must be held strictly liable for damages and the costs of cleanup to the States and private parties resulting from OCS operations. If the oil companies are to reap private profits from public lands, the least that can be required is that they insure against any damage resulting from their activities. The Administration and the Interior Department should give their full support to legislation imposing liability without fault on OCS lessees.

D. Utilization of the Best Available Technology

One of the most disturbing aspects of the DES is the apparent intention on Interior's part to permit OCS drilling and transport without requiring the utilization of the best available technology to prevent oil spills (v. 2, 425-6). The main reason for this seems to be Interior's concern that the oil companies may forego some OCS production as not sufficiently profitable. Once again, Interior's main concern seems to be to encourage the rapid exploitation of the public's oil and gas resources by maximizing the profits of the oil companies. Such a course is not in the public interest. We have played that game before in Santa Barbara and the Gulf of Mexico, resulting in chronic oil pollution of our coastal waters and high prices for our own oil resources. If further OCS production is to take place, it must be done with the needs of the public foremost in our minds. These needs include the prevention of further harm to the public's irreplaceable fishery resources. The goot is therefore obligated to minimize this harm as much as possible.

E. Allocation of OCS Resources

There is no discussion in the DES of how OCS oil and gas are to be used for the benefit of the public. Will the oil companies be allowed to charge whatever price they wish for what are after all public resources? Will there be any requirement that OCS oil and gas be allocated on a priority basis to those regions that are most dependent on imported oil, or will the Administration just let the companies do as they please?

II. ANALYSIS OF ALTERNATIVES

A. Energy Conservation and Demand Reduction

An integral part of any sound national energy program is a specific energy conservation plan. One cannot adequately assess the need for OCS oil and gas without knowing how much of our present and future demand can be reduced by stringent conservation measures. Such a plan would include an analysis of the effects of energy rationing, various tax proposals to reduce demand, and other measures that may obviate the need for OCS development. Even if the need is not totally obviated, the Administration can certainly reduce demand considerably and permit a more deliberate and planned development of the OCS over a longer period of time. But rather than taking this reasonable course, the Administration seems intent on proceeding in an uncoordinated fashion. Such a policy will inevitably lead to further waste of our limited natural resources and eventually increase our dependence on foreign sources of supply.

1. The improvement and expansion of mass transit facilities throughout the country to reduce energy demand should be undertaken on a far greater scale than is presently contemplated by the Ford Administration. A crash program should be initiated immediately to provide commuter systems for those who must now drive to work. The Administration could better accomplish energy conservation, not to mention clean air, if it would make mass transit a priority item in its budget. Instead it has submitted a budget to Congress providing for greater funds for highways than for mass transit.

2. The Clean Air Act Amendments of 1970 require the nation's major urban centers to have Transportation Control Plans. States must implement strategies which will reduce automobile use in heavily congested urban corridors in favor of public transportation. Although this legal requirement was originally devised as a public health measure, it is also one important way in which our fuel resources can be conserved. EPA has estimated that 5.2 million gallons of gasoline can be saved every day in the U.S. if these TCP's are implemented.

3. While airplanes are a low energy-efficient transportation mode, but substantial fuel savings can be attained simply by increasing the airport passenger load factor. This requires more effective planning and scheduling, and a

firm commitment to encourage short-distance commuters to use rail and bus service in place of air service.

4. The automobile companies should be required to increase the percentage of small, fuel-efficient vehicles in place of the big "gas hogs". Although many buyers are now choosing smaller cars, there are still too many big cars being sold. And the auto companies continue to advertise the big cars heavily, concentrating the viewer's attention on the car's flashy style rather than its fuel economy. The public interest requires that the Federal government regulate the auto industry to insure the preservation of our limited fuel resources. Such regulation should include, inter alia, weight limitations for cars (or at least a high percentage of them), greater engine efficiency, and a notice in all advertisements of the car's mileage per gallon.

5. National standards should be established to require increased energy-efficiency in buildings and equipment.

6. A national resource recovery program should be enacted requiring the recycling of our solid waste resources. Besides being a necessary step to protect the environment and to halt the depletion of our forests and other natural resources, recycling will reduce energy consumption resulting from the

manufacture of new products. The Federal Resource Recovery Act of 1970 should be amended to achieve this important goal. It should also be noted that much of our solid waste can be used as fuel, further reducing the demand for oil and gas. It has been estimated by EPA that a resource recovery program could save the nation over half a million barrels of oil per day.

Although the U.S. has only 6% of the world's population, we consume 33% of its energy. This cannot be allowed to continue. In total EPA has estimated that 20% of our 1990 projected demand could be reduced by a strong conservation policy. Until such a policy becomes a reality, the need for OCS development, and the quantity to be produced, cannot be properly assessed.

B. Alternative Leasing Procedures

The present leasing policy of the Department of the Interior is both inconsistent with the requirements of the National Environmental Policy Act of 1969 and with the development of a sound national energy policy. As the policy exists now, tracts are leased to bidders before any exploratory drilling takes place. Both exploration and development are left entirely in the hands of the lessee oil companies. It is not reasonable to continue this policy. First, one cannot prepare an adequate environmental impact statement without knowing what quantities of oil and gas are present in the OCS. The dimensions and location of these resources are necessary to properly assess the possible adverse impact from OCS production. Quantity is important in balancing the benefits to be derived from leasing vis-á-vis the risks to the marine and shore environments. And if the quantity turned out to be small it could hardly be argued that OCS development would significantly reduce our dependence on imported oil. Such essential information as the location and number of drilling platforms, pipelines, refineries and other facilities is not available under present practices until after the lease sale. An environmental impact statement that does not consider such information would be legally inadequate. Second, a sound national energy policy necessitates the identification and quantification of the nation's energy resources before exploiting them. We have to know what we have to work with before any intelligent planning can take place. Third, a fair price cannot be determined if the seller doesn't know what he's selling. Although it is often said that the bidder is running the risk of finding no oil and gas on the leased tract, the government is running the risk of underselling the public's resources.

Therefore, it is imperative that the exploratory phase of OCS operations be undertaken before the leasing phase, and the Federal and State governments should assume direct control over exploration. Data collected should be available to the government and not left in the control of private interests, and the data compiled should then be used to help determine what, if any, areas are productive sites for drilling. It is disturbing to hear so much deferential talk from the Interior Department about the necessity to stimulate the profit motive of the oil companies. National energy policy will never serve the public interest if it remains subservient to the financial interests of the oil companies, who also control the production of our natural gas and coal reserves as well. These companies must not be allowed to continue their stranglehold on the natural resources of this country and keep secret under the guise of "proprietary rights" those facts and figures relating to the location and quantity of these resources which are the property of the public.

With regard to alternative leasing policies, the FES should discuss and evaluate foreign OCS leasing practices such as those in Canada, the United Kingdom, Norway and Denmark.

As one example of an alternative approach that the FES should consider, we set forth the following for your consideration:

If the objectives of the Department of Interior are:

1. To attain the best price for these public resources
2. To increase the level of control over the development of these resources in order to regulate schedule of production and minimize negative environmental impact
3. To provide negative pressure on OPEC prices by the identification of new domestic reserves and thus improve our balance of trade
4. To improve national security by the maintenance of stategic reserves
5. To minimize the need for new taxes or borrowings in the intermediate term to finance exploratory work

then modification or complete revision of past leasing practices must receive serious consideration. In order to increase the level of attainment of the above objectives, the following hypothetical methods are suggested for analysis.

It is suggested that Interior enter into Fixed Price Incentive Fee management contracts with individual major oil companies for specific tracts. The incentive fee could be paid on a per barrel basis when production is initiated. The advantage of this form would be that those managing the exploration could modify their exploratory program on the basis of information gained from completed test holes. Further, the managing company would have an incentive to continue exploration by virtue of the incentive fee. The assignment of these exploration management contracts would be done on a competitive basis and all data developed would be made public.

The cost of exploration contracts could be covered or at least defrayed by having oil companies who have an interest in bidding on production from these tracts purchase options to bid on production prior to the exploratory phase. These options could be of various kinds:

1. A fixed dollar amount with production bidding limited to those who held the options.
2. Variable amounts and used as credits against final bids for production. To further sweeten their value, the option could have an escalator factor built into them so that they increased 25% in value as a credit against production bids. This could reduce pressure for production if workable fields were to be discovered.

Either option (1) or (2) could also be made transferable up to the submission of final production bids which should increase their pre-exploration value.

There are, of course, other alternative leasing and development methods which should be fully explored in the FES.

C. Alternative Energy Resources

With regard to alternative energy resources, it has been reported that there are some 943 capped wells in the U.S. right now (Hearings before the National Ocean Policy Study of the Committee on Commerce, U.S. Senate, 93rd Congress, serial no. 93-99, p. 59). The FES should explain the reason for these capped wells as well as discuss the possible development of so-called secondary reserves as an alternative to OCS development.

III SOCIO-ECONOMIC FACTORS

A. Onshore Impacts

Perhaps the most severe environmental effects from OCS development would be felt on the land. The construction of offshore rigs and other equipment, the installation of terminal facilities, oil refineries, petrochemical complexes and the like, and the influx of additional people into the coastal regions will impose a tremendous burden on the local communities. To protect the natural and other resources of the states' shore areas from just this kind of impacts, Congress enacted the Coastal Zone Management Act of 1972. This Act provides for the development of State coastal zone management plans and requires every Federal agency to conduct its activities in a manner consistent with approved State management programs. The leasing of OCS tracts should await the development of such programs so as to minimize the economic and environmental impacts that are associated with OCS development. It is not a sufficient answer for Secretary Morton to raise the specter of undue delays in leasing caused by dilatory State officials. The fact is that detailed planning can't begin until information about the location and number of offshore platforms, refineries, and other facilities is known. This information should be made available before tracts are leased so that states are not forced to accept as best they can a fait accompli. To accomplish this, it is necessary to separate exploratory drilling from actual production, and bring exploration under the direction and control of the State and Federal Governments. Federal law requires States to act to protect their coastal areas. It would be incongruous, as well as a violation of the 1972 Act, for the Interior Department to accelerate its leasing program before coastal zone management bodies are established and functioning.

The FES should consider the long-term effects of OCS development on the coastal states. What happens to our economies when OCS production ends? What happens particularly to those companies and individuals who were brought in by the oil boom and remain dependent upon it for their livelihood?

B. Financial Costs and Feasibility

There is considerable question about the feasibility of exploiting the additional acreage proposed in such a short period of time. The FES should justify the feasibility of the ten million-acre proposal, the availability of capital, materials and manpower, and the ability of the oil companies to develop and of the U.S. Geological Survey to administer, such a large area at one time. Data from the Project Independence Bluepoint (PIB) Task Force in Oil and Gas indicate that a lack of materials, including shortages of steel, piping, and adequate exploratory and development rigs, preclude the rapid development that the Interior Department has proposed. The FES should consider and evaluate the PIB data in this regard.

There is also the possibility that leasing such a sizable area so quickly may result in lower bids than might result from a less hasty schedule, thus depriving the government of a fair market price.

C. Impact on Other Marine Activities

More detailed analysis is needed of the value of our coastal fisheries than was provided in the DES. The value of these resources cannot be reduced to a dollars and cents figure, as the DES seems to do. The nation's fisheries supply our citizens with food, one of the basic necessities of life. The possibility of permanently damaging this valuable and renewable resource for the sake of exploiting an energy resource that will probably be depleted within 20 years would be insanity. The protection of our fisheries has become even more important in recent days because of the depletion of this resource in the Atlantic by foreign fleets. It must also be remembered that we're dealing with resources that are under great stress. Coastal waters have already been severely damaged by oil, toxic metals, industrial wastes, sludge, and municipal sewage. The threat of additional pollution from OCS production and transportation is therefore an even graver threat than it otherwise would be. The FES must discuss the cumulative effects of OCS oil pollution on the environment and not isolate the problem as if it existed in a vacuum. OCS oil and gas is at best a short-term benefit. Our fisheries are a long-term irreplaceable resource. Before undertaking OCS production, the protection of this critical resource must be assured.

In like manner, the FES should consider more thoroughly the value of recreational and tourist industries that may be adversely affected by an accelerated leasing program. As noted in the DES (v. 1, p. 642), there were 6,744 recreational services along New York State's coastline in 1967, three times more than any other Atlantic state and more than half of the North Atlantic region's total (U.S. Department of Commerce, Bureau of Census, v. V, 1967). It is critically important that these current and future services be adequately considered in the FES.

IV METHODOLOGY

A. Lack of Definitive Commitment

The language of the DES is saturated with non-committal words. Rather than committing itself to a specific course of conduct designed to minimize adverse environmental impacts, the DES merely discusses the various issues as if it had nothing to do with actual decision-making in this area. If the word "may" were to be replaced with the word "will" and "expects" replaced with "shall", the anticipated actions of the government would be more credible. Just to point out one glaring inadequacy in the DES, it is particularly important that the Interior Department clearly demonstrate governmental capability to effectively monitor OCS operations. It is generally believed that most oil spills go undetected by the U.S. Geological Survey or the Coast Guard, and that drilling and transport activities are sources of continuous oil pollution which the Federal government does little or nothing about. The DES does not treat this issue of control adequately.

B. Influence of Baseline Studies

There is a serious question whether the promised baseline studies, which are expected to provide valuable input to the site-specific EIS's, will be available by the time those site-specific statements are scheduled for completion. If they are not to be used in the specific statements, one can question the rationale for spending public money for their completion. If they are to be used, then it necessarily follows that leasing should not take place until these studies are concluded and reviewed. It is our recommendation that this latter course be followed if those site-specific statements are to adequately assess the environmental effects of particular OCS operations.

C. Criteria for Decision-Making

There is an underlying assumption in this DES that the private oil industry is a necessary participant in both the exploration and development phases of the program. This has led to an a priori selection of criteria that will motivate this industrial segment to participate. In short, the pot must be made rich enough to convince this group that it has no better use of its capital. In the face of current high oil corporation profits, there is the chance that the Federal Government may be required to give too much away.

A more thorough consideration of the role of the oil companies in OCS development should be undertaken. For example, in discussing alternative energy sources, do the major oil companies control such resources as coal, gas, and uranium to the extent that competition among alternatives is unduly restricted? Does the vertically integrated character of the oil companies, covering exploration, production, transportation, refining, distribution, and marketing render the industry so concentrated and uncompetitive that supply, demand, and pricing of the nation's energy resources are effectively controlled by the companies? If this is so, then it prevents an accurate appraisal of our real energy needs and the means at our disposal to satisfy those needs. The FES should consider the position of the oil companies as it affects all of the other issues discussed in the impact analysis.

It would be totally inappropriate for the government to adopt the criteria of the private industrial sector. Their interest is in profits and their primary responsibility is to their stockholders. The government is concerned with total social costs and human welfare, and is responsible to all of the people. It is worthy to note that in several circumstances, TVA and REA, where private industry has refused or been incapable of meeting social needs, the government has successfully moved into the void. The FES should consider in detail alternatives to the present policy vis-á-vis the oil companies, including the possibility of a Federal Oil and Gas Corporation to exploit and manage the public's natural resources.

It is critically important also for the FES to set forth its criteria for determining whether areas should be developed or not. How is the value of increased oil production to be weighed against the value of our fisheries and recreational industries?

In conclusion, let me focus on an intangible but very real problem posed by an accelerated OCS leasing program. A policy of massive leasing encourages more energy consumption and reduces the pressure to conserve energy and develop alternative energy sources that are more economical and less destructive environmentally. And accelerated leasing does little to reduce dependence on foreign oil because it does nothing to control the demand. Unless we begin immediately to bring energy demand under a system of rational control, OCS oil and gas will simply be depleted within a short period of time with no resolution of the underlying problem.

It is essential that the public interest be protected throughout any possible OCS development. If this requires greater regulation of the oil companies and perhaps a lessening of their hugh profits, then so be it. We are past the stage where we can leave issues of critical public importance to the vagaries of the marketplace.

Thank you for the opportunity to comment on the DES.

State of New York

The substantive comments of the State of New York were submitted by the Department of Law, Attorney General's Office. Many of the issues raised by the State have been addressed in other responses, and the responses here represent highlights of other responses and changes in the final EIS.

Disposition

I. General Policy

A. Lack of a National Energy Policy - This issue is discussed in Section VIII on Alternatives.

B. State Participation in Decision-Making-- Such participation is becoming more prevalent. State involvement in tract selection has been solicited, States have always had a review role in site-specific impact staements, and the Department has recently proposed a policy level Federal - State Advisory Board for OCS related matters (Meeting with Coastal States Governors, May 21, 1975). These are but three of many new and existing input points for State participation.

C. Strict Liability for Lease Holders - Current operating orders indicate complete liability already rests on the lease holder. An element of fault does exist in the orders, however. Several legislative proposals for revision of the OCS Lands Act call for an Oil Spill Liability Contingency Fund, to be maintained at $200 million.

D. Utilization of Best Available Technology - The discussion of economics of requiring "best available technology" has been deemed inappropriate for an environmental impact statement. Such considerations are treated separately and are presented to the Secretary as decision-making data. Best available technology could mean one-of-a-kind technology, technology with the best conceptual design but as yet untested, or prohibitively expensive technology. Fishery resources are not irreplaceable; assurances of maintenance of long term productivity of fishery resources are the necessary data that would determine that OCS leasing has no long term impacts on our valuable fisheries.

E. Allocation of OCS Resources - This type of discussion is inappropriate in an environmental impact statement.

II. Analysis of Alternatives

A. Energy Conservation and Demand Reduction - Perhaps the major subsection in Section VIII on Alternatives is now devoted to energy conservation. Project Independence and Ford Foundation Energy Policy Project data are used.

The recommendations for methods of conservation are now part of the EIS; most of these suggestions are included in the EIS, Section VIII.

B. Alternative Leasing Procedures - These inadequacies of the present system are addressed in the EIS, as well as the implications of a separation of exploration and development. Many of these data can be estimated by industry, USGS, and other groups with some degree of precision. The consequences of estimating are constantly checked by post-sale analyses of bidding patterns, eventual production, profits, etc. to check pre-sale valuations. Federal and State control over exploratory drilling is discussed in Section VIII. Alternative leasing policies are also discussed, although they don't generally have discernible environmental impacts, e.g., bonus v. royalty bidding.

C. Alternative Energy Resources - Secondary reserves are discussed. The number of capped wells rises and falls over time. Wells may be shut in for workover or any number of legitimate reasons. The USGS role in supervising operations, which includes approval or denial of requests to "cap" wells, is discussed.

III. Socio-Economic Factors

A. Onshore Impacts - Coastal zone management planning and separation of exploratory and development drilling are discussed in Section VIII. The environmental and socio-economic impacts on individual States will be addressed in more detail in site-specific impact statements.

B. Financial Costs and Feasibility - The proposal is now defined in terms of number of sales per year and analyzed on a region-by-region basis. Specific acreage figures have been eliminated from the proposal. Materiel shortages are addressed in Section VIII. Valuation of tracts nominated for leasing is based on resource value; minimum acceptable values would mean that less acreage would be leased if bidding levels dropped because of a larger number of sales.

C. Impact on Other Marine Activities - Resource valuation is a difficult process. The types of renewable and highly valuable resources in each OCS region are portrayed in Sections II and III based on Fish and Wildlife Service information. Again, fisheries are a renewable resource, as long as they are not depleted below levels precludning recovery.

IV. Methodology

A. Lack of Definitive Commitment - The use of certain words such as "may" reflects the fact that these comments are intended to show the Department's jurisdictional authority. For instance, the Department may issue notices to lessees to correct an unforeseen impact-producing action, but the Department may not suspend a lease without showing cause. To commit the Department to specific courses of action before unknown difficulties arise is a precarious undertaking. Many oil spills may go undetected, but the cost of continual surveillance would be prohibitively expensive. The Department feels that the coverage given the OCS by Coast Guard fly-overs and USGS inspections are adequate for mitigation (see the attached response of USGS to the Energy Under the Oceans report)

B. Influence of Baseline Studies - Baseline environmental studies are not specifically designed for data acquisition for input into site-specific impact statements. They are designed as pre-drilling surveys which will allow data collected after drilling commences to be compared for changes in environmental conditions. Any data collected which may augment existing information will be used in site-specific statements.

C. Criteria for Decision-Making - A discussion of the oil industry involvement in OCS development, and the vertical integration, and the ownership of alternate energy sources, is deemed inappropriate for an analysis of the impacts of accelerated OCS development. This seems to be a matter for the Federal Trade Commission and Justice Department to investigate, as it has ramifications far beyond the OCS program.

It also seems clear that in a free market economy such as we have, the supply of energy resources must perforce be linked to profit considerations. Larger Federal Government roles in the OCS program, such as Government sponsored exploratory drilling and development based leasing procedures are discussed in Section VIII on Alternatives.

An EIS sets out those potential environmental impacts that could result from adopting the proposal at hand. It does not address those purely economic considerations that are developed elsewhere and are presented to the Secretary for decision-making on the relative advantages and disadvantages of proceeding in some form or another. These data are presented to the Secretary in a Program Decision Option Document, which portrays the criteria used, and choices open to the Secretary.

Energy conservation, its implementation, costs, and benefits, is discussed in Section VIII. However, the charge of the programmatic EIS is to analyze the impacts of the accelerated leasing proposal primarily, and to consider the viable alternatives to the proposal. Energy conservation in some form seems to have a National consensus; the question remains, What if it doesn't work to the degree necessary to remove dependence on foreign oil?

EXECUTIVE DEPARTMENT

LOCAL GOVERNMENT RELATIONS DIVISION

240 COTTAGE STREET S.E. • • • • SALEM, OREGON 97310

TOM McCALL
GOVERNOR

J. N. PEET
Director

January 8, 1975

Mr. Curt Berklund, Director
U.S. Department of the Interior
Bureau of Land Management
Washington, D.C. 20240

Dear Mr. Berklund:

Re: Draft Environmental Impact
Statement - Increased Acreage
for Oil and Gas Leasing
PNRS #7411 4 080

Thank you for submitting your draft Environmental Impact Statement for State of Oregon review and comment.

Your draft was referred to the appropriate state agencies. The State Fish Commission and the State Department of Geology and Mineral Industries offered the attached comments which should be addressed in the preparation of your final Environmental Impact Statement.

We will expect to receive copies of the final statement as required by Council of Environmental Quality Guidelines.

Sincerely,

William M Brown

William M. Brown
Acting Administrator

WMB:Lm

Attachments

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

LOCAL GOVERNMENT RELATIONS DIVISION
DEC 2 4 1974

Local Government Relations Division
240 Cottage Street S.E., Salem, Oregon 97310
Leslie Lehmann, Coordinator Phone: 378-3732

PNRS STATE REVIEW

Project #: 7411 4 080 Due Date: DEC 13 1974

To Agency Addressed: If you intend to comment but cannot respond by the return date, please notify us immediately. If no response is received by the due date, it will be assumed that you have no comment and the file will be closed.

PROGRAM REVIEW AND COMMENT

To State Clearinghouse: We have reviewed the subject Notice and have reached the following conclusions on its relationship to our plans and programs:

☐ It has no adverse effect.

☐ We have no comment.

☐ Effects, although measurable, would be acceptable.

☒ It has adverse effects.

☒ We are interested but require more information to evaluate the proposal.

☐ Please coordinate the implementation of the proposal with us.

☒ Additional comments for project improvement.

- - - - - - - - - - -

REMARKS (Please type or print legibly)

Since Oregon-Washington areas (volume 2, page 328-329) had the least resource (oil, gas) potential (17/17) yet were high in environmental hazard (8-13 with 13 most hazardous), we recommend that no offshore leasing occur in this area until biological base line studies are undertaken to adequately assess potential damage.

The EIS contains numerous errors in describing Oregon natural resources and possible adverse effects. For example:

1. Volume 2, page 16, purse seines and weirs have not been in use in Oregon since 1948.

2. Volume 2, page 109, dredge spoil disposal is a controversial subject in

Agency Fish By Charles K. Waif

Oregon. No attempt was made to obtain this information. No mention was made of present Corps of Engineer practices of in-bay disposal.

3. Volume 2, page 191-194, no mention was made of potential impacts on Oregon's razor clam resources.

4. Volume 2, page 201, no consideration was given to the importance of this community for spawning (herring, lingcod, etc.) and the disastrous potential impacts from oil spills.

If specific sites are located off Oregon with more resource potential, each should be assessed for its total impact on Oregon via Corps permits, state permits, land use planning, etc. Environmental impact statements may be required for each site and associated pipelines and onshore facilities.

Leases off Oregon should require stipulations (mitigative measures) to protect fishing areas, refuges, sanctuaries, razor clam beaches, etc.

cc Division of State Lands
Environmental Protection Agency
National Marine Fisheries Service - Portland
  Cliff Soderstrom
Oregon Wildlife Commission
U. S. Fish and Wildlife Service

NOV 26 [illegible]

DEPARTMENT OF
GEOLOGY AND MINERAL INDUSTRIES

ADMINISTRATIVE OFFICE

1069 STATE OFFICE BLDG. • PORTLAND, OREGON • 97201 • Ph. (503) 229-5580

TOM McCALL
GOVERNOR

November 22, 1974

State Clearinghouse
Local Government Relatiions Division
240 Cottage Street, S. E.
Salem, Oregon 97310

Gentlemen:

Subject: Outer Continental Shelf Leasing Review, Draft Environmental Statement
DES 74-90

We believe that continued exploration of continental shelf lands for oil and gas minerals is essential for the welfare of the country. Following the Santa Barbara blow-out, all U. S. Outer Continental Shelf Lands were placed under a moratorium. No drilling has been done on them since 1969 except for some on going development work.

The prohibition on offshore exploration was placed because of the Santa Barbara "catastrophe." Subsequent studies and the cleaning up of harbors and shorelines show that no lasting damage occurred. Aquatic animal and plant life regained its prior stability within a year and the bird population has since stabilized. Scientific studies made since the blow-out report that continued build-up of sewage and industrial effluents are far more dangerous to the aquatic environment than accidental spills.

Regulation of offshore drilling and development has been strengthened considerably since 1969 by the Federal government and surveillance has been increased. Even before the strengthening of rules for offshore exploration in 1969, the industry had improved its method of operation offshore.

Items that appear to us to be a concern for development off the Oregon coast are the use of explosive seismic equipment, erection of offshore platforms, shallow test drilling, and installation of onshore equipment.

Drilling should be prohibited in estuaries and on the beaches. Onshore facilities should be installed in a manner which includes a regard for aesthetics. No test-core drilling should be allowed without a Federal or state observer aboard the drill ship and that such drilling be limited to a depth of 500' below the ocean floor. Bottom sampling could proceed without observation as long as the ship did not have the capability to drill.

For coastal areas used for recreation which are sensitive to industrial development, sea-floor development should be required. All pipe lines and onshore facilities should be buried, recessed or screened from view.

Seismic surveys can be conducted for the most part with non-explosive type equipment. Explosives should be permitted only when deemed necessary and then on a cooperative basis where all companies can share the information. Explosive surveys should be made under the direction of fishery agencies, should require an observer on the shot boat, contain a fish scanning device and the shot boat be followed by a boat with an observer to count fish kill in every shot boil.

The Federal government should make public all records from offshore exploration within 5 years from the date of issuance of each exploration permit or lease. All records, including core samples, are currently locked in the files of the United States Geological Survey. It is essential that this data be made public property after a reasonable time has been allowed for the exploring company to protect its investment.

Sincerely,

R. E. Corcoran

R. E. Corcoran
State Geologist

REC:bj

EXECUTIVE DEPARTMENT

LOCAL GOVERNMENT RELATIONS DIVISION

240 COTTAGE STREET S.E. • • • • SALEM, OREGON 97310

Robert Straub
~~TOM McCALL~~
GOVERNOR
Stafford Hansell
Director

January 23, 1975

Mr. Curt Berklund, Director
U Department of the Interior
Bureau of Land Management
Washington, D.C. 20240

Dear Mr. Berklund:

Re: Draft Environmental Impact
Statement - Increased Acreage
for Oil and Gas Leasing
PNRS #7411 4 080

The State Clearinghouse has received additional comments suggesting areas for improvement on the Increased Acreage for Oil and Gas Leasing Draft Environmental Impact Statement subsequent to our January 8 letter.

The State Wildlife Commission offered the following:

> The Wildlife Commission staff concurs with and adopts as our own the Fish Commission of Oregon comments concerning fish resource impacts, U.S. Fish and Wildlife Service comments on waterfowl and sea birds, and National Marine Fisheries Service comments on marine mammals.

Please consider this letter as an addendum to our previous letter.

Sincerely,

William M. Brown

William M. Brown
Acting Administrator

WMB:Lk

State of Oregon

The draft EIS was reviewed and commented upon by the State Fish Commission, the State Wildlife Commission, and the Department of Geology and Mineral Industries. These comments were gathered and forwarded by the Local Government Relations Division of the Executive Department. Corrections which have been made are noted in the disposition as "Editorial."

Disposition

State Fish Commission

1. Volume 2, p. 16 - Editorial.
2. Volume 2, p. 109 - Editorial.
3. Volume 2, p. 191-194 - Editorial.
4. Volume 2, p. 201 - Editorial

The remainder of the Commission's comments have been noted.

Department of Geology and Mineral Industries

Last paragraph, first page - Federal drilling can not be conducted in estuaries or on beaches. State coastal planning can dictate the aesthetics or even the presence of onshore facilities. New geological and geophysical survey regulations by the USGS permit observers; however, we would like addition information regarding the choice of a 500 maximum depth of test-core drilling.

Second page, first paragraph - Again, this comes under State jurisdiction.

Second paragraph - Most seismic survey work today is conducted with non-explosive acoustic sources. These will be closely scrutinized, if proposed, by the USGS under its proposed geological and geophysical survey permit system (Federal Register, April 18, 1975).

Third paragraph - The proposed regulations concerning geological and geophysical surveys provide for disclosure of geologic information within one year, and other information generally within ten years.

State Wildlife Commission

This Commission concurs with and adopts the comments of the State Fish Commission presented above.

OFFICE OF THE GOVERNOR
DIVISION OF PLANNING COORDINATION

DOLPH BRISCOE
GOVERNOR

JAMES M. ROSE
DIRECTOR

January 15, 1975

Mr. Curt Berklund
Director
Bureau of Land Management
United States Department of the Interior
Washington, D. C. 20240

Dear Mr. Berklund:

The draft environmental statement (DES) concerning the proposal to accelerate Outer Continental Shelf oil and gas leasing, as submitted by your office, has been reviewed by the Governor's Division of Planning Coordination and by other interested State agencies.

Review participants have generally concurred that the cited DES is in conformance with the National Environmental Policy Act of 1969. In addition, the Texas Water Rights Commission indicated that special monitoring of the leasing program within the broad context of all Gulf operations will be necessary to insure that the beneficial use of State waters and related natural resources of the Texas coastal zone is not jeopardized.

This Division notes that increased natural gas imports from Canada as projected by the Federal Power Commission and others may have to be reassessed, in view of the recent Canadian decision to possibly restrict exports.

Enclosed are the comments from review participants; these comments are submitted with the constructive intent of aiding your planning efforts and to insure proper consideration of the cumulative effects of the proposed leasing program. If we can be of further assistance, please let us know.

Sincerely,

James M Rose

JAMES M. ROSE
Director

JMR/wsb
Enclosures
cc: Mr. Joe D. Carter, Texas Water Rights Commission
Mr. Charles R. Barden, Texas Air Control Board
Mr. Clayton T. Garrison, Texas Parks and Wildlife Department
Mr. Hugh C. Yantis, Jr., Texas Water Quality Board

P. O. BOX 12428, CAPITOL STATION, AUSTIN, TEXAS 78711
Phone 512/475–2427 Offices Located in Sam Houston State Office Building

TEXAS WATER RIGHTS COMMISSION

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December 20, 1974

Brigadier General James M. Rose
Director, Division of Planning Coordination
Office of the Governor
P. O. Box 12428, Capitol Station
Austin, Texas 78711

Attention: Mr. Wayne N. Brown

Re: U.S. Department of the Interior, Bureau of Land Management -- Draft Environmental Statement (DES) for Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf, DES 74-90, October 18, 1974.

Dear General Rose:

By letter of December 3 you requested State agency comments on the referenced comprehensive document, pursuant to the Commission's duties as a member agency of the Interagency Council on Natural Resources and the Environment to assist your office in making clearinghouse reviews of Federal projects as required under the provisions of Office of Management and Budget Circular No. A-95.

The Commission technical staff has reviewed the referenced document with particular emphasis on the portion pertaining to the Offshore Texas Region in the Gulf of Mexico.

The staff finds that:

1. The referenced document is in conformance with the requirements of the National Environmental Policy Act of 1969.

P. O. BOX 13207 AREA CODE 512 AUSTIN, TEXAS 78711

2. The proposed lease sale of three million acres of the Outer Continental Shelf (OCS) does not appear to hold any immediate danger of impairing the use of State waters, as defined in Section 5.021, Texas Water Code.

3. Additional OCS land leasing may have potential, long-range impacts on the State water resources in the Texas coastal zone. Statement is made on page 6, DES, Vol. 1, that "(C)urrently, the Nation's entire supply of domestic OCS oil and gas comes from the Gulf of Mexico, specifically, the Texas-Louisiana OCS." It is reasonable to assume that the State of Texas will feel the expanded economic input-output effects resulting from the additional oil and gas extraction activities in the offshore Texas OCS region. The effects on the State coastal waters admittedly, could be indirect and involve varying lag-time periods of impact. The cumulative effects on coastal waters and the coastal zone because of the expanded oil and gas extraction operations, the steady increase in commercial navigation traffic, and the steady intensification of industrial and port developments and operations could be substantial. The staff believes that special monitoring of the leasing program within the broad context of all Gulf operations will be necessary to insure that the beneficial use of State waters and related natural resources of the Texas coastal zone is not jeopardized.

The foregoing comments are presented with the constructive intents of insuring proper consideration of the cumulative effects of the proposed leasing program, and adoption of adequate safeguards to protect the vital coastal water resources of the State of Texas. If you have any questions on the above comments please write to, or telephone the undersigned (512-475-2678).

Sincerely yours,

TEXAS WATER RIGHTS COMMISSION

Alfred J D'Arezzo

AJD:ll

By: Alfred J. D'Arezzo, Ph.D., (C.E.)
Special Analyst for Environment and
Interagency Coordination

TEXAS AIR CONTROL BOARD

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8520 SHOAL CREEK BOULEVARD

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December 13, 1974

Mr. Wayne N. Brown, Chief
State Planning and Development
Office of the Governor
Division of Planning Coordination
P. O. Box 12428, Capitol Station
Austin, Texas 78711

Dear Mr. Brown:

We have reviewed the draft environmental statement for proposed increase in acreage to be offered for Oil and Gas Leasing on the Outer Continental Shelf. We feel the environmental impact has been adequately assessed for air quality. This project will not conflict with our State Implementation Plan.

Thank you for the review opportunity. If we can be of further assistance, please contact me.

Sincerely yours,

Bill Stewart, P.E.
Director
Control and Prevention

TEXAS
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San Antonio

December 20, 1974

Mr. Wayne N. Brown, Chief
State Planning and Development
Office of the Governor
P.O. Box 12428, Capitol Station
Austin, Texas 78711

Dear Mr. Brown:

The Texas Parks and Wildlife Department has reviewed the draft environmental statement on Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf.

We offer no comments on this draft.

Thank you for the opportunity to review the document.

Sincerely,

CLAYTON T. GARRISON
Executive Director

CTG:WJS:ac

TEXAS WATER QUALITY BOARD

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EXECUTIVE DIRECTOR
PH. (512) 475-2651

1700 NORTH CONGRESS AVE. 78701
P.O. BOX 13246 CAPITOL STATION 78711
AUSTIN, TEXAS

January 6, 1975

Re: Draft Environmental Statement,
Proposed Increase in Acreage,
Oil and Gas Leasing on Outer
Continental Shelf

General James M. Rose, Director
Division of Planning Coordination
Office of the Governor
P. O. Box 12428, Cap. Sta.
Austin, Texas 78711

Dear General Rose:

The staff of the Texas Water Quality Board has reviewed the draft environmental statement for the proposed increase in acreage to be offered for oil and gas leasing on the outer continental shelf and the following comments are offered concerning this matter.

This agency has addressed its attention to the effects these oil and gas operations will have on water quality near the Texas coast. The proposed monitoring programs should be designed to describe the critical environmental conditions before the onset of each development and continue to monitor these parameters during operations. Long-term as well as short-term effects should be considered in the review of environmental information and conditions.

As noted in the draft statement, minor oil spills or seepage will inevitably occur. Preventive measures should be taken so as to handle most expeditiously such circumstances when they occur.

Thus, the preventive tactics will protect the current aesthetic values and water quality conditions that exist on the Texas coast.

We appreciate the opportunity to review this proposed project. If we can be of further assistance, please let us know.

Sincerely,

Emory G. Long

Emory G. Long, Director
Administrative Operations Division

cc: TWQB District 6,7,11, and 12

State of Texas

The Division of Planning Coordination under the Office of the Governor compiled the comments submitted by the Water Rights Commission, Air Control Board, Parks and Wildlife Department, and the Water Quality Board. Each set of comments is addressed below. The Division of Planning Coordination noted that increased natural gas imports from Canada may have to reassessed, since Canada may decide to restrict exports.

Disposition

Texas Water Rights Commission

The Commission felt that DES 74-90 met the requirements of NEPA, that the proposed lease sale of three million acres does not pose an immediate danger of impairing the use of State waters, and that State monitoring of the Gulf of Mexico leasing program will be necessary to insure the beneficial use of State waters and related natural resources.

Texas Air Control Board

The Air Control Board felt that the environmental impact had been adequately assessed for air quality, and that the proposal will not conflict with the State Implementation Plan.

Texas Parks and Wildlife Department

The Department offered no comments on the draft EIS.

Texas Water Quality Board

The Water Quality Board expressed concern that environmental monitoring programs describe critical conditions before the onset of development and continue to monitor during operations. This is the specific goal of the Department's environmental studies program. Long term effects should be partially exposed if the program is given sufficient funding to carry the monitoring effort several years hence.

Every effort will be made, from both Federal management and supervision levels, to control and mitigate all discharges, large or small.

SOUTHEASTERN VIRGINIA
PLANNING DISTRICT COMMISSION

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O. A. SPADY - VICE CHAIRMAN
G. ROBERT HOUSE, JR. - TREAS.

110 W. PLUME STREET, NORFOLK, VA. 23510
TELEPHONE: AREA CODE 804 - 622-5301
ROBERT F. FOELLER - EXEC. DIR. & SECY.

March 11, 1975

Mr. Curt Berklund, Director
Bureau of Land Management
Interior Building
Washington, D. C. 20240

Re: Draft EIS - Outer Continental Shelf
Oil and Gas Leases (LUG:17)

Dear Mr. Berklund:

Pursuant to section 102(2)c of the National Environmental Policy Act of 1969, the staff of the Southeastern Virginia Planning District Commission has reviewed the Draft Environmental Statement - Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf. As discussed in the Draft Statement, significant economic benefits can be expected to accrue in coastal communities due to OCS development, as well as some amount of environmental loss. In order to maximize the benefits and minimize the losses, the SVPDC staff supports OCS development at a controlled rate so as to allow for progressive local and regional planning to take place and accommodate the economic input.

According to the Army Corps of Engineers in the Draft James River Basin Report, 1975:

> If this [offshore oil drilling] were to become a reality, submarine pipelines to shore would deliver oil to terminals, and possibly refineries, petrochemical plants and industrial complexes. . . . it is conceivable that construction of refineries and/or terminals, or similar industrialization could take place along to James estuary and thereby affect the riverborne commerce needs to the extent that a deeper channel could become economically feasible. In addition such development would certainly have far-reaching and widespread implications for employment, economic output, income and population in the region, with an associated demand for increased public services, increased land development, air and water pollution, and social strains on affected communities.

Due to the accelerated development of the offshore oil and gas deposits in the North Sea, local governments have suffered serious problems in the United Kingdom. In addition to the community problems from the increased population, there is also a tendency for a diversion of labor from traditional employment sectors due to the higher wages offered by the oil industry.

It is our recommendation that the Department of Interior take the following steps before proceeding with the proposed leasing of 10 million acres for OCS oil and gas development.

1. Sponsor exploratory development in order to make more accurate estimates of the OCS oil and gas deposits.

2. Coastal areas should be allowed time to plan for the OCS development.

3. Lease the acreage over a long enough period of time to allow for planned growth and for more advanced technology to develop as the leasing continues.

4. Above all, proceed at a slow enough pace to minimize degradation of the environment and the community infrastructure.

Thank you for the opportunity to review and comment on the Draft Environmental Statement - Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf. Hopefully, our comments will assist you in the development of the final report. If we can be of assistance in your study, please do not hesitate to call.

Sincerely,

Robert F. Foeller
Executive Director/Secretary

JH:bm

Attachment

SOUTHEASTERN VIRGINIA PLANNING DISTRICT COMMISSION

STAFF COMMENTS ON

DRAFT ENVIRONMENTAL STATEMENT - PROPOSED INCREASE IN ACREAGE TO BE OFFERED FOR OIL AND GAS LEASING ON THE OUTER CONTINENTAL SHELF

Page No.	Comment
	Volume I
6	We support the proposal to "expand the Nation's domestic oil and gas energy supply, as long as it can be done in an environmentally safe manner," however a great amount of planning must be done in order to accomplish this goal.
7	Since the Atlantic and Alaska OCS areas are frontier drilling areas, we would hope that drilling activity would begin at a very slow pace to allow for technology improvements and social adjustments.
20	Granted, it would be difficult to numerically rank areas according to environmental concern on a national level. In Southeastern Virginia, however, the wetlands and recreational beaches are of primary concern. It is public policy of this Commonwealth to preserve the wetlands and to prevent their despoliation and destruction and to accommodate necessary economic development in a manner consistent with wetlands preservation.
21-22	Using the figures presented on pages 21 and 22, the 710 trillion cubic feet of gas estimated to be discovered on the OCS will be only a 21-day supply if the demand for gas is 34.5 trillion cubic feet per day in 1980, as stated.
105	The percentage of equipment failure seems to be high enough that it could be considered environmentally dangerous.
201a	If the linear ridges and nearshore barrier islands are susceptible to pronounced morphologic change during storm activity, would this not create a severe hazard to oil and gas pipelines?
	Volume II
161	Onshore growth of all kinds must be considered. The possibility of new refineries should not be dismissed as a "geographic-transportation problem."
184	It should be noted that the Southeastern Virginia coast contains many of the unique environments listed here, such as marshlands and barrier islands, wildlife refuges, and highly productive estuaries.
233-234	We question the apparent failure to consider Virginia in this discussion.
242-246	Rapid population and economic growth could have tremendous negative impacts in the Hampton Roads area. If the growth due to offshore drilling and related fields does not occur over an extended period of time, a shortage of proper housing and community services could result in a degradation of the social environment.

Page No.	Comment
308	It is implied that only a large oil spill would degrade the recreational beaches. The chronic oil pollution due to the increased shipping and other activities should be mentioned along with how aesthetically displeasing it is for beach users to be exposed to even minute amounts of weathered oil.
314	Virginia Beach attracts hundreds of thousands of people every year. A large oil spill could not only ruin the economics of the area's recreational suppliers and services over the short term but it could also ruin its appeal over the long term, merely by reputation.

COMMONWEALTH OF VIRGINIA
OFFICE OF THE GOVERNOR
COUNCIL ON THE ENVIRONMENT

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State Health Commissioner

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Chairman, Board of Conservation and Economic Development

WILLIAM H. WEST
Chairman, Commission of Game and Inland Fisheries

January 30, 1975

Mr. Curt Berklund
Director
Bureau of Land Management
United States Department of
  the Interior
Washington, D. C. 20240

Reference: 3310 (732)

Subject: Draft Environmental Impact Statement for the Proposed Increase in Oil and Gas Leasing on the Outer Continental Shelf (DES-74-90)

Dear Mr. Berklund:

On behalf of the Commonwealth of Virginia I wish to thank you for the opportunity to comment on the subject document. The following state agencies participated in this review:

Division of Industrial Development
Commission of Outdoor Recreation
Department of Conservation and Economic Development
Virginia Institute of Marine Science
State Water Control Board
State Air Pollution Control Board
State Department of Health
Division of State Planning and Community Affairs
Office of the Attorney General

The question of ownership of the Atlantic seabed and its resources is before the United States Supreme Court which is scheduled to hear oral arguments on the matter February 24, 1975. There is extant an agreement between the Atlantic Coastal States and the Federal Government that no formal leasing proceedings will be initiated by the Federal Government pending resolution of the case of the United States v. Maine, et al.

We understand that the Interior Department does not construe the preparation of a draft environmental impact statement on the Atlantic Continental Shelf as an assertion of jurisdiction over such shelf. In filing this comment the Commonwealth does not waive any right, claim, title to or interest in the Atlantic Continental Shelf. With these understandings in mind, we are pleased to respond.

GENERAL COMMENTS

Basically, we are in accord with the three goals for leasing of OCS Lands as stated by the Bureau of Land Management (Vol. 1, p. 170):

1. orderly and timely resource development
2. protection of the environment
3. receipt of fair market value

It seems that these goals could be achieved through cooperative effort and careful planning to maximize opportunity while minimizing the potential adverse effects noted in the statement, as well as others not covered. The recognition of the necessity for continuing interface of effort by the Federal and state governments has been pointed out (Vol. 1, p. 118 et seq.).

In view of this, we are disappointed in the quality and depth of analysis of the subject document, and generally find it an inadequate evaluation of the environmental impact of continental shelf oil and gas leasing. The onshore impacts in particular are not adequately addressed. Rather, the discussion relies completely on Chapter Seven of the OCS Oil and Gas - An Environmental Assessment published by the Council on Environmental Quality, April, 1974. A more definitive study of the onshore impact on Virginia is desirable and necessary. For example, information should be given in the report on the ability of current water supply and sewage treatment facilities to meet the sudden increase in population along the coast. It is our understanding that the site-specific environmental impact statement currently being prepared will address these and other onshore impacts. We trust our comments will be incorporated therein as well as in the final environmental statement.

It appears that in writing the subject draft environmental statement the Bureau of Land Management has given the impression that offshore gas and oil production would not really impact the environment to any great extent; and that insofar as recreation, preservation of historic sites, and protection of unique natural areas or the wildlife thereon are concerned, there is no need to worry. We object to this.

We believe that if the people of the Commonwealth of Virginia are going to become involved in the production, transportation and refinement of the gas and oil believed to be present beneath the OCS, they should do so knowing full well that once the land, water, air, and the plants and animals are committed to this project, there will be no way to turn back. Places and things as we now know them will change, and one purpose of an environmental impact statement is to provide for thorough identification, examination and anticipation of these changes and their effect.

It is typical that the discussion of "alternatives to the proposed action" is the most disappointing part of environmental impact statements. This statement, like most others, treats this, which should be a most important part of the environmental impact statement, as an obligatory task of explaining away alternatives. Particularly unconvincing is the dismissal of Alternative D, i.e., postpone increase in OCS leasing until environmental protection can be increased, impacts can be better understood, or onshore management plans can be drawn up. The criticism that environmental studies tend to be inconclusive is in part true, but the almost complete lack of information about certain kinds of effects continuously referred to in the environmental impact statement certainly suggests that important and definable questions desperately need answering. Furthermore, the desirability of developing land use and coastal zone management plans to control onshore development seems self-evident. The conclusion that delay also has its impacts, which may or may not be greater than those due to accelerated leasing, is a non-conclusion.

The consideration of Alternative F (i.e. energy alternatives) likewise falls short because it considers alternatives only independently rather than together and more or less tacitly assumes a historical energy growth scenario. Several important and responsible investigations (e.g., the Ford Foundation's Energy Policy Project) have concluded that a national program emphasizing energy conservation could forestall the necessity to tap new energy sources such as new OCS development and shale oil exploration. The Federal Administration should be developing an energy policy which establishes goals and priorities in an integrated fashion rather than floodgate and piecemeal responses for increasing energy supply.

By addressing the environmental impact statement to so extensive a geographic area, constraints of time and manpower prevent a detailed treatment of specific areas. The areas differ so drastically in all subject areas considered that a general treatment is not realistic, and yet in regard to the impact assessment, a blanket generalized approach is taken. As a result, site-specific potential problems are not identified and addressed.

Nevertheless, a preliminary decision will be made to lease or not lease specific OCS areas on the basis of this document. It is pointed out that DES 74-90 "...will not substitute for a site-specific impact statement in any area for any given leasing proposal." (p. 15, Vol. 1). Assuming that site-specific environmental impact statements will be prepared with greater detail and more complete analysis of impacts, this evaluation should at least result in statements that the potential for environmental impacts in one area versus another is more or less serious based on the scientific evidence. Such an analysis does not seem to be present. If site-specific environmental impact statements are subsequently considered unnecessary or are simply extracts of the present environmental impact statements, the present treatment is woefully inadequate for a realistic assessment of the impact on Virginia.

Note that the mid-Atlantic,including Virginia, ranks first in order of industries' preference for frontier exploration areas (Table 2, p.8, Appendix H) and second among areas in a composite ranking of resource potential and industrial preference (fifth when non-frontier areas are considered as in Table 3, p. 9, Appendix H). It seems to us that the Commonwealth of Virginia is being asked to endorse or approve a document that does not satisfactorily address the appropriate questions. The document, as it is, is so monolithic and dilute, that it is difficult to address and evaluate the pertinent questions for Virginia (which is treated simply as a part of the mid-Atlantic region). It is perhaps questionable on our part to take so parochial a view as to consider Virginia of paramount importnace (certainly the entire nation is involved), but we live here, not in Alaska, New England, or Florida. Hence, we are concerned that if this document leads to leasing of OCS areas adjacent to Virginia, we could suffer or be subjected to worse impacts than other areas might experience.

POLICY RECOMMENDATIONS

Accordingly, we offer the following policy recommendations: Proposals for the use of continental shelf energy resources must flow from, and be reviewed in light of, a comprehensive energy policy that takes into account the fundamental goals of our society, as consistently advocated by the National Governors' Conference. The nation's energy policy should be truly national, and should be developed and implemented in partnership with the states, with full opportunity for public review and comment. It should deal with the short term, mid-term and long term, balancing sound energy conservation and supply measures, balancing environmental protection and industrial development, balancing research toward new energy sources and reliance on existing technologies.

The continental shelf is a great natural resource. It should be managed with scrupulous care to insure its long term productivity and to protect the rights of the public.

The decisions as to whether, when, where, and how to develop and produce any resources which Atlantic shelf exploration may discover should reflect quantitive assessments of the probable energy benefits, the positive and the negative economic effects, the probable social and environmental impacts, and the commercial value of the public's resources. All probable net adverse budgetary impacts of development should be identified as well as costs of preparation for clean-up of oil spills and costs of removal, conversion and rehabilitation of onshore installations.

Both regional and site-specific environmental impact statements should precede leasing decisions. Baseline studies of the Atlantic shelf environments should be carried out promptly and thoroughly. Strict environmental controls should be imposed on exploration, development and production phases.

The federal government and the states should recognize that the unique regional characteristics within the Atlantic Coast (e.g. Georges Bank, Baltimore Canyon Trough, Georgia Embayment) and of other offshore regions may require variations in certain aspects of policy formulation.

It is extremely important that all interested parties review and comment on the impact statement to be prepared for each individual area to be offered for leasing.

SCIENTIFIC EVALUATION

The most severe impact that implementation of this project could have on the marine environment would result from spilled oil. The effects on aquatic life of such a spill can be lethal as well as sublethal and are long in duration. Increases in turbidity and sedimentation and resuspension of toxic substances in bottom sediments would result from the construction and burial of pipelines. These would have negative impacts on many species of marine biota.

The various discharges from the drilling rigs represent another major impact. Drilling muds, drill cuttings, and formation waters would all be discharged overboard. And finally as a direct result of this project, additional oil refineries and petrochemical plants may be constructed. Effluent flows from existing facilities of this type would also be greatly increased.

We are deeply concerned with potential adverse affects on shellfish in particular. Shellfish off the coast of the United States are a commercially valuable resource, not only for Virginia but for most of the coastal states of this country. Scallops and surf clams in offshore areas and oysters, soft-shell clams, and hard-shell clams in the near shore areas and estuaries support a multi-million dollar industry.

We must emphasize the great need for proper environmental safeguards during all phases of oil and gas exploration and mining on the OCS.

Detailed comments offered by the Commission of Outdoor Recreation and the Virginia Institute of Marine Science addressing numerous particular errors and inadequacies are included in Appendix A and Appendix B. We urge your close attention to them.

I hope that these comments are useful to you and that more definitive information regarding the potential impacts of OCS leasing will be forthcoming in the near future. Thank you again for the opportunity to comment.

Sincerely,

Gerald P McCarthy

Gerald P. McCarthy

GPM:dls
Enclosures - Appendix A and B

cc: Honorable Mills E. Godwin
Honorable Earl J. Shiflet
Honorable Gerald L. Baliles
Mr. J. F. Alspaugh
Mr. R. R. Blackmore
Dr. J. L. Calver
Dr. W. J. Hargis
Mr. E. T. Jensen
Mr. B. C. Leynes
Mr. W. R. Meyer
Mr. E. F. Wilson
Mr. O. H. Adams
Mr. L. Lawson
Mr. F. Basile

APPENDIX A

COMMONWEALTH OF VIRGINIA
DETAILED COMMENTS ON DES 74-90

The following comments represent a composite of the reviews made by Mr. Rob R. Blackmore, Director of the Commission of Outdoor Recreation. Specific comments are confined to Volume 2 of the Statement as follows:

Page 212

Statement 1. The area of a beach disturbed by pipeline construction will be small and the first high tides following burial of the pipeline will serve to restore the beach terrain.

Comment. This may be true but probably isn't. Because of the change incomposition of the beach material on the surface following burial of the pipeline, it could take a season or a year or more to completely restore the beach terrain between the low and high tide lines. Below the low tide line and above the high tide line the mark of the buried pipeline could be visible for years.

Statement 2. Restoration of the beach ridge will take longer, most likely requiring a storm tide or high winds to obliterate the effects of excavation.

Comment. This is partly true--it will take longer, but to suggest that a "storm tide" or "high winds" will obliterate the effects of the excavation is pure fantasy. Once the dune line is cut it could be several years before the mark of the pipeline would be entirely obiliterated.

Page 213

Statement 4. The impacts from terminal facilities could be mitigated somewhat by locating them at some distance inland where recreational use is not intense.

Comment. Here again the statement is suggesting that there would be no impact if there were no users of the recreation area.

Statement 5. Other seashore related activities such as beachcombing, shell collecting, painting, shoreline nature study, camping and sunbathing would be much less attractive for an inderterminate period where an oil spill had covered a beach.

Comment. This statement, as does the one statement immediately above, gets away from the resource and discusses activities. This is wrong, but even if it weren't, the use of the phrase "would be made much less attractive" suggests that there would be some use made of the beach. It seems very unlikely that any person would, for example, sunbathe on a beach covered with oil.

Statement 6. Recreational use of the area would be precluded during the time that oil covered the beach and during the cleanup process also.

Comment. This is a true statement and is included here for comment merely to reinforce our criticism of the statement above.

Page 214

Statement 7. Even after burial of the pipeline, the scars will cause an impact on the aesthetic values of the beach and associated dunes and sand flats. It is our estimation that the impact will endure for at least a year,---.

Comment. This is a true and directly contradicts the statement we have listed as number 1 on page 212.

Page 253

Statement 8. Marine sport fishing can be adversely affected by oil spills.

Comment. Delete "can" and insert "will".

Page 255

Statement 9. The beach rapidly assumes its normal appearance.

Comment. The word "rapidly" means different things to different people and its use in this statement makes the statement of no real value. On page 214 it is stated that the impact of the pipeline crossing of a beach will endure for at least a year. Since no one really knows how long the scar will remain we suggest deleting "rapidly" and inserting "eventually".

Statement 10. Oil that saturates beaches could remain for many months at some depth in the sand and may continue to be a problem.

Comment. Delete "may" and insert "will".

Page 258

Statement 11. Since the only adverse affect on sport fishing that could result from offshore operations is the massive oil spill, we cannot quantify this unpredictable impact.

Comment. This statement may be true but we believe that the numerous contaminants such as oil field brines which might trigger red tide (page 170), drilling fluids, drilling muds, resuspended toxic heavy metals and persistent pesticides (page 180) could also have an adverse affect on sport fishing. Further reference is made to sport fish on page 202, (6) Wildlife and Sport Fish, but the paragraph that follows the heading fails to mention sport fish.

Page 315

Delete the word "may" and insert the word "will" in lines 6, 8, 10 and 13.

COMMONWEALTH OF VIRGINIA
DETAILED COMMENTS ON DES 74-90

The following comments represent a composite of the reviews made by Messrs. Boesch, Roberts, Bender, Merriner, Zeigler, Van Engel, Wass and Lynch of the Virginia Institute of Marine Science staff.

Volume I

General Comments

1. Extensive misspelling of scientific names, especially in certain sections, and misspelling of common English words can be found. These are distracting and ultimately annoying when frequent. Several sections of the report are poorly written: incorrect grammar, awkward sentence structure, ambiguous expressions. One loses sight of the forest for the trees.

2. There is inadequate discussion of commercially important species for the Atlantic coast. Noteworthy by their absence from serious discussion are many important fin fishes, bay scallops, penaeid shrimp, blue crabs, lobsters (American and spiny) and stone crabs. No reference to coastwise migratory patterns for mackerel, striped bass, blue fish, shrimp, etc. Also important are offshore spawning areas for catadromous fishes and other species. The treatment for oysters, calico scallops, and those few other commercial species mentioned is inadequate from the fisheries standpoint. No reference is made to recreational fisheries, which are probably roughly equivalent to commercial fisheries in terms of biomass harvested.

3. The treatment of the various biological topics is very uneven. I will grant that this results in part from the different emphasis in the various reports of contractors who collected the baseline data. It also reflects undue haste in preparing the EIS and an inadequate appreciation of the data.

4. In a great number of sections, data in contractor reports has been misstated in the EIS. A number of specific instances are spelled out in the specific comments attached--several other exist.

5. One would expect to have a general picture of the biology of the Atlantic coast after reading the summary in the EIS. Such is not the case. Graphic and tabular presentations in many areas would contribute to greater clarity and understanding. The textual presentation should paint a mural in broad strokes, rather than a series of disconnected miniatures. Special highlighting should be given to subjects of importance in discussion of impacts.

6. There is an inordinate use of general data surveys (i.e. VIMS, 1974; TRIGOM, 1974; URI, 1974). The first two of which are only draft documents, the third of which is an incorrect citation (should be 1973). Much more reliance on original work should have been made.

Specific Comments

P. 14 et seq. A justification is given for preparing EIS for a very extensive OCS area. However, section title refers to "Underlying Assumptions." It is hard to determine what the author considered to be assumptions.

(1) impacts can be generalized for all the OCS regions? or
(2) as stated in para. 1, p. 16.

If these are the assumptions, this should be made explicit

P. 237, para. 2. ambiguous--is the author referring to a taxonomic classification scheme based on physiological, distributional and morphological criteria, or to three classification schemes?

P. 238, last para. Why not use biogeographic name rather than South Atlantic region shelf?

P. 239, line 19-21. Annual productivity ... in August ...? 547 $gC/m^2/yr$. True for area off Sapelo and Altamaha sounds, not coast in general.

line 2. Virginian Province for Central Atlantic region?

P. 240, line 5-7. Not clear
line 15 "and" or "through"?
line 18 units incorrect - citation incorrect - data not in VIMS 1974

P. 240, last Para, Boreal Province for North Atlantic region?

We find it hard to believe that the Gulf of Maine is depauperate in phytoplankton year round! But that's what is implied!

P. 241, line 18. units incorrect

based on what study? I suspect there is an estimate for a specific locale, not the Gulf of Maine and North Atlantic shelf in toto.

line 19, et seq. not clear. area of reference? entire Atlantic coast? G. brevis in Gulf of Maine? Implies that all species listed cause paralytic shellfish poisoning which is not true to our knowledge.

P. 242, line 10-12. Refers only to dinoflagellate blooms in Georgia which were not referred to as red-tide blooms! Next sentence--idea derived from where?

P. 243, line 4-6--awkward
line 12. What about echinoderm larvae?

P. 244, para. 2 and 3 are incorrect restatements of para. 2, 3, 4, p. 132 and Table 3.5, p. 133 in VIMS, 1974.

P. 245, line 19-22. Salinity not the factor, temperature is _________ see fig. 4.4, p. 4.6, URI, 1973.
Ref. URI 1974 incorrect here and elsewhere

P. 246. What about seasonality of copepods and other plankters, Gulf of Maine, due to water circulation patterns? (Redfield, 1939?)

P. 248, line 9. Should read (Day, et al. 1971, in VIMS, 1974)

P. 251, line 3 - incorrect citation, not VIMS 1974.

P. 252. mid-page. Nekton

--Anadromous fishes do not generally spawn in marshes. Mid-channel and tributary streams are the principal spawning areas. Was term estuaries intended here?

--Sciaenids, hakes, blue crab, etc. Also enter the estuary as larvae.

--The on-offshore boundary does not hold for the mid-Atlantic region; nor does the north-south boundary hold for Alosine fishes, menhaden, bluefish, sciaenids, Percichthids, lobsters, or the Carolinian and Caribbean elements. Boreal fauna enters the mid-Atlantic region by going deeper into the water column (slope-canyon).

P. 253. 20-200 m zone of mid-Atlantic is not affected by temperature changes???

--see Industrial Fish Project Completion Report, VIMS 1968-69 by J. Davis.

P. 254. fishes and other biotic elements of system have habitat associations.

PP. 254-255. Note the ranking by Wright for South and Central Atlantic, i.e. migratory components, N-S overlap of Virginia and Carolinian faunas.

P. 255. last paragraph. Alosids: 4 species
open waters: dolphin (Coryphaena), scombrids (wahoo, skipjack, bonitos, yellowfish, bigeye, blackfin, etc.), billfishes (marlins, spearfishes, swordfishes); sharks, carangids, deepsea fishes in outer shelf, slope, and canyon habitat, etc.

P. 255. both in and offshore, sciaenids, bluefish, etc.

--the significance of the inshore area and estuary as nursery and production of pre-recruits is inadequately covered for the ecologically and economically dominant fauna.

P. 257. Therefore the fauna of the mid-Atlantic is not endemic: seasonally Virginian and Carolinian on the OCS.

--Thermal preferences and tolerances account for faunal changes. See p. 253. comment re. temperatures.

The whole section seems inadequately prepared to us. The faunal types are defined in zoogeographic sense then discussion based upon fishery statistics regions. This is not sound ecologically and presents a distorted view of areal characteristics.

P. 258, top of page. Temperature changes in mid-Atlantic do exist.
--Text buries the significance of the estuarine and nearshore habitat to the production of Atlantic coastal fisheries.
Plankton (meroplankton) occurs in all areas, offshore also (0-200m). No other statement of the planktonic aspect of fish life in OCS. Sources: Merriner, Joseph, etc.

Should address the trophic relationships and food web dependence of harvestable finfish on lower elements.

P. 259, line 11. Manatee never reported from mid-Atlantic region--at max. extent of distribution, it ranged to North Carolina--many years ago.

P. 260. para. 1. We don't agree that the "Data pertaining to oceanic birds...preclude all but a surficial discussion."

The second group of birds includes both petrels and shearwaters.

Wilson's storm petrels have not been observed in flocks exceeding 10,000, nor have shearwaters, although that many may be seen passing a given point over a period of several hours.

P. 260. para. 2. No marine birds feed on detritus.

It is very disheartening to note that no mention was made of all the other birds in the VIMS report, particularly the loons, gulls and terns which occur along the outer coast. Loons and sea ducks are very susceptible to oil spills. No mention was made of the great concentrations of ducks and geese which occur in coastal estuaries and lagoons, or of the many shorebirds which depend on beaches for their food.

P. 261. two commercial scale calico scallop beds--calico scallops are found throughout Carolinian Province

P. 262. faunal assemblage presented only for Oculina sp., not for other corals found as outcrops in Carolinian Province.

P. 263, line 1-3. We don't find any reference to "black rock reefs" in URI 1973 nor am I aware of any other documentation of this specific habitat in the Virginian Province.

P. 264. Wind conditions are uniform along the entire Atlantic Coast? That doesn't seem reasonable since several climatic zones are involved.

P. 559, line 2-5. Coastline from Florida Keys to Cape Fear smooth except for areas from St. Johns River, Florida to Winyah Bay, South Carolina. In this region, there are broad barrier islands backed by anastomosing channels and sounds. A broad band of salt marshes flanks these sounds and channels between the islands and the mainland. The sentence is poorly constructed to boot.

P. 559, line 5-6. True for North Carolina barrier islands, but less so for Georgia islands.

para. 2. Use of "embayed" and "embayment" is confusing. The Georgia coastline is often called the "Georgia embayment" referring to the broad slice from the mainland between South Carolina and Florida. Rocky shores occur south to Nantucket Bay.

P. 562, para. 3. Zostera ranges from south of Beaufort, North Carolina North--the boundary is not precisely definable but definitely not Beaufort, North Carolina. Incorrect inferrence about temperature tolerances of Zostera and Halodule.

P. 563, para. 2. You must mean Cape Canaveral as the northern limit for mangrove swamps, not Cape Hatteras.

P. 563, line 18. "Barnacles, oysters, ... are occasionally found in this habitat." Contrary to fact so far as I know--mangrove swamps are a major habitat for barnacles and oysters in the subtropics. Also see line 6, p. 564 which refutes statement.

P. 564. Rocky shores--fails to adequately discuss sharp zonation characteristic of this habitat, differences between protected and exposed shores, and controlling factors. These concepts are significant to assess recovery of biota if impacted by oil. Especially important are biological factors in control of zonation.

P. 565. Selection of species as typical epipsammon is unusual--psammon refers to species closely associated with sand, epipsammon, those living on the sand--in contact with sand--such as some amphipods. Birds and fish are clearly more associated with air and water than sand--there might be some case for designating beetles as epipsammon, though these are terrestrial, not marine.

P. 566. Overly simplified discussion of man's effects on dunes--incomplete Some of this description refers to barrier islands, some to the shoreward side of mainland high energy beaches. It leaves the reader with an unclear picture of the habitat.

P. 568-569. Figure selected from VIMS 1974 refers to transect across a barrier island (Fig. 5.8, VIMS 1974). Figure 5.6 would be appropriate for describing a salt marsh.

P. 572. MSX has caused mass oyster mortality in some realitively localized areas (Chesapeake Bay and Delaware Bay) and is known from Connecticut to North Carolina at low infestation levels. Statement here implies widespread epidemics along the entire Atlantic coast which is not the case.

P. 573, line 12. Valuation of worm and clam flats seems very low. Land in many areas exceeds $3750/acre, even some rural areas. Can one really place a valuation on a habitat in dollars and cents, and, if so, is it valid to do so on the sole basis of annual yield of commercially important fisheries species? Compared to the value placed on lease rights and extracted oil, an acreage valuation of even $4000 is ludicrous.

P. 575. Nanochloris and Stichococcus are chlorophytes (micro-flagellates), not diatoms.

P. 576, line 6. Part about nutrients from freshwater input. True for some estuaries on Atlantic coast but not others.

P. 577. What about use of estuaries as nursery grounds for catadromous fishes (sciaenids, menhaden, and in the broad sense penaeid shrimp)? No place do I see any reference to penaeid shrimp, and little reference to blue crabs, both of major commercial importance and characteristic of estuaries.

The whole section starting on page 691 is poorly documented and makes some very shaky general statements.

Volume II

General Comments

The discussions and conclusions on environmental impacts, both on the offshore and nearshore environments, are grossly inadequate. The following are major criticisms:

Although admitting in the beginning of the discussion and in several places throughout that lack of knowledge and hard data on effects, particularly of oil, does not allow quantitative estimates of expected impact, the statement nonetheless proceeds in doing precisely that. A case in point is the estimate of how much bottom might be impacted by drilling cuttings. Particularly in those sections entitled "Summary of aggregate and cumulative impacts, etc.", the authors make strong conclusions not supported by data. For example, "we estimate that the overall impact will be minimal" (p. 175) and "benthic life in the Gulf of Mexico is apparently not suffering large-scale adverse effects from present offshore development" (p. 188). What is "minimal," what is "large-scale"?

There are several places in the discussion of impacts, where laboratory data are explicitly rejected as evidence of adverse effects since test conditions differ drastically from those in the field. Unfortunately, certain effects cannot be effectively evaluated in full-scale oceanic tests since the requisite parameters cannot be measured or controlled.

In the author's rush to show no significant impact of OCS development, results from actual spills are discounted or explained away (in those cases where a significant impact was reported), or are cited as evidence of a lack of impact (if the data was inadequate to reach any conclusion for lack of baseline data, adequate sampling during the post spill period, or sufficient concern on the part of the investigator to collect adequate data). One is left with the impression that sophisticated scientific analysis leads to a conclusion of no long-term impact as determined by learned scholars, when we, qua scientists, cannot state definitively what the impacts will be, qualitatively or quantitatively.

The reliance on testimonal quotations and secondary citations in literature reviews for much evidence presented is appalling. Much credence is given to Oppenheimer's (a microbiologist and oil industry consultant) comments about effects on fisheries and to Jones' (a geologist) statement on effects on ecosystem recuperative powers (p. 168-169). An unreferenced source, not supported by data, is relied on and extrapolated to assess the extent of the effect of drill cuttings on benthic life. The statement is made that the deposits "appear" to be inhabited with "normal" benthic fauna. This type of hearsay evidence is not subject to independent evaluation and thus has no place in this discussion. Many reviews are cited (e.g. Nelson-Smith, Boesch, Clark, Onuf, Ketchum, etc.); those who prepared the statement did not even bother to consult the original sources which serve as the bases of these reviews.

The ad nauseum references to the impact of offshore Louisiana oil fields are annoying because in almost all cases there is little hard evidence to support the contentions about lack of effects there. Only in the case of fishery statistics are there any data to examine, the rest is subjective impressions or conclusions based on complete lack of evidence. However, even the fishery statistics are far from conclusive. Despite assertions to the contrary there are no reliable historical catch-per-unit-effort data to compare. The type of effort for important fisheries such as shrimp has been subject to change in Louisiana, thus total reported catch per number of registered vessels is not necessarily comparable through time. Furthermore, they obscure changing geographic patterns in effort and catch. Surely, the Gulf of Mexico is still productive, but conclusions about changes in productivity are not scientifically justifiable. Other conclusions about lack of effects on plankton and benthos may or may not be true, but are totally unsupported by any reliable evidence which we know of.

The rather cavalier fashion in which the possibility of effects on benthic organisms (in other than very shallow waters) is dismissed is disturbing (e.g. p. 187). There is absolutely no evidence to support this position. It is a popular misconception that all oil floats. Oil has been found in sediments in all spill areas and in OCS operating areas. Furthermore oil tends to persist in sediments longer than in surface waters or intertidally, thus the potential for more long-term effects is more real. Blowouts such as that at Santa Barbara may result in a release of oil below the sediment surface providing an easily understandable avenue for contamination of bottom sediments. No data exist on the effective water depth at which benthos can be affected by oil spills--in fact sediments in the deep Santa Barbara basin have been reported contaminated with petroleum hydrocarbons by Kolpack.

Equally disturbing is the fact that no attempt has been made to rank the OCS areas considered with regard to the probability of a significant impact. The MIT attempt to make such an evaluation which was included in the CEQ report is not mentioned let alone evaluated critically. The MIT report should be discussed even if only to reject the conclusions.

Specific Comments

P. 160. Toxicity of drilling mud elements. We are addressing Marine fauna on OCS, not freshwater.

P. 168. Oppenheimer's (upper statement) contradicts Rita Colwell's data for Baltimore Harbor and Chevron fire data: longterm retention of hydrocarbon envelope: sequential loss of subunits over time.
Biodegradation: alkenes - bacteria
middle - protozoans
complex residue - fungi

P. 168. Oppenheimer's second statement.

The development of purse seine fishery in the Gulf for Brevoortia patrons smithi as well as Opisthonema oglinum paralleled the oil development. Therefore, commercial landings biased! Proportionate catch of various species should be examined. Also trophic levels. The conclusion is ill-founded.

Jones' comment: Earlier said in report that chronic effects unknown then cite sublethal impact. There remains a question as to the succession of species in phyto- and zooplankton after spill.

P. 172, para. 2. The discussion of the relative sensitivity of meroplankters and holoplankters is misleading. Meroplankters are especially sensitive to pollutants by virtue of their short temporal existence. They are not necessarily more sensitive than holoplankters in terms of TL50's--some holoplankters are extremely sensitive to pollutants (though not with reference to oil). Further one might question the validity of any such discussion based on results obtained with estuarine species which have been subjected to pollutants for sufficient periods for some adaptive selection to have occurred resulting in more tolerant populations.

The last part of para. 2 can be justified only if certain assumptions hold: 1) reproductive period is long, 2) larvae are widely dispersed, 3) setting sites have not been adversely affected.

P. 172-173. It is stated that any nektonic animal, since it is nektonic, can and does detect and avoid adverse conditions including oil. We are unaware of any proven cases of avoidance of oil (except perhaps Rice, 1973) related to salmon fry. Salmon fry studies are usually done in fresh water, and if this is the case for Rice, 1973, which I have not seen, can we validly assume a similar response for salmon or other species in marine waters? The statement attributed to Nelson-Smith (1971) was stated as an hypothesis, not a proven fact.

P. 175, para. 1. From this paragraph, I learn that "Numerous dead...whales, dolphins, and elephant seal pups..." found during the Santa Barbara oil spill "...was not high"--just an every day occurrence and therefore not a result of oil spills. I had been under the impression that cetacean strandings were an infrequent occurrence.

Impact small? No mention of pelagic ichthoplankton earlier cited pileherd egg and larval mortality in spill area (oil vs. dispersant). Egg and larvae are not as mobile as juvenile and adult fishes. This impact potential greater. The absence of quantitative data makes the statement of minimal impact expectation rather tenuous.

EIS fails to stress this interaction of biotic levels in the ecosystem. Trophic impacts from differential mortalities or sublethal effects may be extreme.

Could have a wide ranging impact upon local biota as well as wide geographic impact due to migratory and transport phenomena on shelf.

P. 176. Not only were bivalve molluscs "especially vulnerable"; virtually no animals survived. But from this discussion one might conclude that many species other than molluscs survived.

P. 177. To say that the pile of cuttings was colonized by several animals characteristic of "normal" benthic fauna is not the same as to say it developed a "normal" fauna. Which is it? If the former, I'd say a significant impact had been observed.

The discussion of sea grass beds near drilling rigs seems meaningless. Sea grass beds are restricted to relatively shallow depths by their need for light, whereas oil drill rigs are often in great depths (200 m and more). Certainly drilling off that Atlantic coast will not occur in sea grass beds which are restricted to protected estuarine waters!

P. 184. Unique environments: Canyons, slope? Sediment burden of pollutants. Transport via physical, chemical, bioturbation. Down dumping from shelf into canyon (deep sea floor) of bound or accumulated pollutants.

Conclusion reached at top of p. 187 really stretches the point beyond supportive evidence. Ditto, mid-page re. gulf fishing landings data inadequate to detect changes.

Nekton: meroplanktonic phase not able to effectively avoid oil spill. Therefore, could lead to decreased production of pre-recruits and stock decline accumulative effects if persistent or frequent oil pollution.

P. 184. Fail to indicate the significance of mid-Atlantic OCS as spawning center for the major species of economic and ecologic importance (see Mermap data).

P. 190. Accidental spills from oil operations beyond the immediate area of production must be considered as related environmental hazards. Must treat oil production as a whole from well head to finished product.

P. 218. What about the physical structure itself and its impact upon alternate users or hazard to other operators (platforms, terminals, pipeline).

P. 275. Same comment regarding new fishery development in Gulf Coast area. Distort total landings. International fishery in the mid-Atlantic area.

P. 304. Marine organismal effects of oils will be both species specific, community specific, and food web generally. Effect is on more than local levels and thus negates the comment that it would not involve the entire marine community.

P. 306, No. 4. How about other toxicity mechanisms in addition to clogged respiratory mechanisms.

State of Virginia

Comments from the State of Virginia came from the Southeastern Virginia Planning District Commission and the Council on the Environment, Office of the Governor. In general, the Commission supported OCS development, as long as it could be accomplished at a controlled rate that would allow progressive local and regional planning and accommodation of the economic input. The Commission submitted a set of recommendations and specific comments, which are addressed below.

Disposition

Southern Virginia Planning District Commission

Each of the recommendations are treated as alternatives in the final EIS. Regarding the time frames for development, even immediate leasing would not result in large scale community changes for several years. Much of the possible onshore development is dependent on the quantities of oil and gas that come into production over time. Additionally, much of the potential production of the Middle Atlantic will probably be transported to industrialized areas on the Delaware River.

Specific Comments

Volume I

Page 6 - The Department agrees that a great amount of planning must be done, if accelerated OCS leasing is a worthwhile National Goal.

Page 7 - It has been and remains one of the basic purposes of the Department's OCS leasing program to provide an orderly development of resources concomitant with an assurance of minimum environmental and socio-economic degradation. The States have a major role in determining what level, if any, of development is consistent with their own State planning goals.

Page 20 - Several other States have equally important wetlands and similar legislative, social, and economic determinants of wetland use. This is the primary reason that ranking of various resources region-byregion was considered a dubious proposition in terms of objectivity and reliability. The significant resources for each region are portrayed in Sections II and III; environmental risk of development is also addressed in Section III.

Pages 21-22 - billion??

Page 105 - Specific equipment failures are a normal part of the functioning of heavy equipment; however, they should not be translated directly into environmental hazard. Many failures arise during equipment testing and can be corrected before systems are operating on oil and gas production. Most, if not all, pollution control equipment has redundant control capacity, i.e., one specific equipment failure is backed up by another piece of control equipment.

Page 201a - It could create a hazard to oil and gas pipelines; this possibility is factored in to the natural hazard risk analysis in Section III.

Volume II

Page 161 - The implications and basic descriptions of onshore development are addressed in Sections I. C. and III. G. In general, while pipeline terminals and pumping facilities will be necessary in many areas for transportation, the most significant development would be a refinery. However, there is significant pressure for refinery development at the present time, without any acceleration of OCS development. This presents an analytical difficulty, since the base case of the refinery development that would take place without OCS is unknown, but apparently much higher than our present capacity. Increased domestic oil production would replace imports as feedstock for these refineries. The "geographictransportation" question is discussed in Section III.

Page 184 - Editorial

Pages 233-234 - Editorial

Pages 242-246 - This type of local community impacts are more properly addressed in the site-specific impact statement that will be prepared if the Middle Atlantic is considered for potential leasing.

Page 308 - Chronic oil pollution and its potential effects are discussed in greater detail in this final EIS.

Page 314 - The recreational values of Virginia Beach are considered in general; see response to comment on pages 242-246 above.

Council on the Environment

General Comments

The Council is correct that a more definitive discussion of onshore impacts to Virginia will be addressed in a site-specific impact statement on the middle Atlantic region. It is clearly not within the scope of this programmatic EIS to present detailed discussions of onshore impacts for each and every coastal State. Further, the Department is fully aware that accelerated OCS development will reap profound changes on the Nation's physical-biological and socio-economic environments. The nature and magnitude of these changes are difficult to predict, but can at least be generally represented; relative risk of development in different areas has been addressed.

Page 3, third paragraph - Section VIII on Alternatives has been completely rewritten to reflect the official and public concerns. Postponing OCS acceleration is treated in several ways.

Page 3, fourth paragraph - Alternative energy sources in combination are discussed in Section VIII.

Page 4, first paragraph - The treatment of risks of development in Section III is based on those parameters that are differentiable among regions.

Page 4, second paragraph - The Council is completely wrong in the first sentence, and thus the rest of the paragraph. This final EIS will serve the Secretary in his decision-making concerning 1) acceleration in general and 2) sequencing of frontier area environmental analyses. The Secretary could decide to initiate the chain of events (call for nominations, tract selection, draft EIS preparation, public review, public hearings, final EIS) that could lead to leasing decisions. However, it must be made clear that the Secretary's decision to consider an area (e.g., the Middle Atlantic) commits the Department to the site-specific environmental impact statement analysis alluded to above.

Page 4, third paragraph - Virginia would be one of the states included in a site-specific EIS analysis of the consequences of leasing in the middle Atlantic region.

Policy Recommendations

The implications of developing a National energy policy, if in fact the Nation does not have one at present, are discussed in Section VIII.

The Department is committed to scrupulous management of the OCS, consistent with orderly development and maintenance of long term productivity.

The EIS process allows many of these issues to be addressed. Much of the economic data is not presented in an EIS, as it is necessarily restricted to presenting the environmental consequences of any proposal. Economic data is presented to the Secretary in a Program Decision Option Document to aid in his decision-making.

The remaining three paragraphs adequately summarize the Department's objectives and guidelines for proper preliminary planning. The sole exception is the regional EIS, which appears to have little value when implementation of an OCS leasing plan is based on discrete sales and modification of lease sale proposals.

Scientific Evaluation

All these various sources of impact-producing effluents are discussed in the final EIS. Shellfish and possible impacts are discussed in Section II, Description of the Environment and Section III, Generic Impacts on Commercial Fisheries, Benthic Marine Life, and Unique Environments.

Detailed Comments (Mr. Balckmore)

Comments accepted by the Department which merit a change in text are simply noted by the word "Editorial".

Statement 1 - Editorial

Statement 2 - Editorial

Statement 4 - Editorial

Statement 5 - Seashore resources are determined by activities and the values that people place on the opportunities to conduct these activities. The point is well taken for those cases where oil covers a beach; however, there is a wide spectrum of extent of oil coverage from small pieces of tar to complete oiling.

Statement 8 - Editorial

Statement 9 - Editorial

Statement 10 - Editorial

Statement 11 - Other effects on sport fishing are addressed in Section III on Impacts.

Page 315 - Only the odor statement has been changed as suggested. Night lighting at sea is not necessarily aesthetically displeasing, nor is a low level of noise. "May" is used in reference to birds and wildlife only because they may not be in critical life stages when the activity takes place.

Detailed Comments (Staff at Virginia Institute of Marine Science)

Volume 1 - General

1. Extensive editing has been accomplished in the final EIS.
2. The U.S. Fish and Wildlife Service provided a description of significant resources in all regions. More detail on population levels, and distribution, commercial value, and potential impacts

will be supplied in a site-specific EIS.

3. More information should be supplied on this criticism
4. These will be treated in response to the specific comments.
5. This section has been significantly edited.
6. It is the purpose and scope of this programmatic EIS to paint a broad picture; more specific and original work will be utilized in a site-specific EIS.

Volum 1 - Specific

P. 14 - Assumptions have been incorporated into the definition of the proposal.

P. 23F - The word "classification" as used have does not imply a taxonomic or plylogenetic classification, but simply an ordering of organisms.

Page 238 - Although Carolinean province could have been used, we attempted to remain consistent with our somewhat artificial breakdown into **17** OCS regions.

Page 239 - Editorial

Page 240 - Editorial

Page 240, last paragraph - Editorial

Page 241 - Editorial on units. It should be stated here that, as was stated at the beginning of this section, much of the information has been derived from secondary sources (TRIGOM, VIMS) which overviewed large geographical areas. In many cases these sources were not repeatedly cited.

Page 242 - Editorial

Pages 243, 244,245 - Editorial

Page 246 - We fail to catch the meaning of this comment.

Pages 248, 251, 252, 253 to end of specific comments - The remainder of the comments are mainly editorial in nature. In most cases, these changes are reflected in the edited text of the final EIS. Again, many of the comments are of a detailed nature and are more appropriately addressed in a site-specific EIS.

Volume 2

General comments

Para. 2 - Much of the impact discussion is replaced by an analytical methodology which examines the area-by-area risks of development. Qualitative and subjective judgments of impacts are kept to a minimum, and are replaced by statements of possible generic impacts and, in general, overstatements of the possible magnitudes of impacts.

Para. 3 - We have stated that this is one of the primary reasons that impact prediction (specificity and magnitude) is an inexact science.

Page 7, para. 1 - It is unfortunate that the reviewer developed the impression that the draft EIS was biased toward minimum impacts and that scientists had concluded that no long term impacts would result. The final EIS has been revised to be clearer on these points.

Para. 2 - Most, if not all, the background material (including original material) has been investigated, recomposed, and supplemented to present a more coherent and factually correct document. Reliance on questionable sources and authors has been minimized.

Para. 3 - It seems that a lack of significant demonstrable impacts of OCS operations in Louisiana and the Gulf of Mexico is prima facie evidence of lack of long term effects, at least over a 10 to 20 year period.

Para. 4 - The discussion of impacts on benthos has been revised in the final EIS. The fact of sediment entrainment of spilled oil is presented, along with its potential for damage.

Last para. - Section III of the final EIS develops a methodology for analyzing the risks of development in each of the 17 OCS areas. The mit report to CEQ is utilized in this analysis.

Specific Comments

Page 160 - The reason this reference was used is that no critical scientific studies have been performed, to our knowledge, on the effects of drilling much components on marine fauna.

Page 168 - Oppenheimer's quotes have been removed.

Page 168 - The recommendations for analysis of commercial fisheries in the Gulf of Mexico entail extremely detailed work and have not been investigated in this EIS. The Jones comment has been removed.

Page 1F2 - This section has been revised.

Pages 1F2 - 143 - Editorial

Page 1F5 - Information was taken from Straughan (1971). Pelagic ichthyoplankton are given increased stress in the final EIS. Remainder is editorial.

Page 176.- Editorial

Page 177 - If there were no recolonization, that would probably be the most significant impact. Recolonization shows some attempt at recovering a "normal" assemblage.

Page 184 - Editorial

Page 190 - The entire system, from platform and wellhead to refineries, is considered for possible effluent sources.

Page 218 - These impacts are discussed in Section III.

Page 275 - Editorial

Page 304 - Editorial - whole community would be affected to some degree (unspecified).

Page 306 - Editorial.

3. PUBLIC HEARINGS:

Three public hearings were held in 1975 concerning the accelerated leasing proposal. The first was held in Anchorage, Alaska on February 4 and 5. The major issues raised at this hearing were: (1) the need for a national energy policy, (2) the need for energy conservation, (3) adequate consideration of the socio-economic and environmental impacts, (4) the lack of State and local input into OCS planning, and (5) the geologic problems in the Alaskan OCS.

On February 6, 7, and 8, the Beverly Hills, California hearings were held. The emphasis was on (1) the need for a national energy policy, (2) the need for completion of a State coastal zone management plan prior to leasing, (3) the lack of knowledge concerning environmental impacts of the proposal, (4) the lack of State and local input into the planning, and (5) the concern about the geologic hazards that may be encountered.

In Trenton, New Jersey, the last of the hearings took place on February 11-14. Of interest to these hearings were the following issues: (1) the lack of environmental impact knowledge, (2) the safety of offshore development, and (3) the need for a cost-benefit analysis on OCS oil and gas development.

The following section will be broken into three major categories to include all major issues raised at the hearings. They are (1) Program Policy, (2) Impacts of OCS Leasing, and (3) Compliance with NEPA and CEQ Guidelines. The next section will include regional issues and the final section will include the comments that were not a part of the hearing record.

PROGRAM POLICY

1. Numerous comments indicated the need for a national energy policy to be formulated before leasing the OCS. This program should cover the specific national energy requirements and consider all reasonable means of providing this need in an environmentally safe, economically feasible, and timely manner.

2. Numerous speakers also expressed their concern over the lack of a national conservation ethic. It was felt that the Nation as a whole should become more aware of energy conservation, and that such conservation should be practiced by government and public alike in order to obtain the maximum benefit from any and all energy sources.

3. The need to develop alternate energy sources at an increased rate was also expressed. Several speakers felt that too much emphasis is being placed on finite hydrocarbon energy sources when development of other relatively unlimited energy sources as solar energy, wind and water power, fusion and hydrogen gas are only receiving a token amount of funding from government and private industry alike.

4. A number of speakers expressed concern over the failure of the Department of the Interior's leasing program to adequately substantiate the need for immediate offshore leasing in the face of inadequate

and/or unproven offshore drilling technology for seismic and deep water regions, lack of adequate refinery and tank farm capacity to process additional quantities of petroleum, and the short supply of general construction supplies, operating capital, offshore platforms, and trained drilling crews.

5. A considerable concern was also evident regarding inadequacies in the present leasing system. It was felt that the Government should get a larger percentage of the profits realized from OCS development and that this increased revenue should be shared by the States, especially those coastal States that must furnish additional infrastructure as a result of OCS development. Additional concern was also voiced about the need for a "full liability clause" concerning the costs of oil spill clean-up, etc., which would arise from OCS development.

6. Several speakers expressed the desire to see the Department do its own exploratory drilling in the OCS prior to any leasing for production so that more realistic valuation could be accomplished for tracts proposed for leasing and so the government would know first-hand just how much energy potential exists in an area before leasing it.

7. Numerous speakers expressed the need for finalization of State and local coastal zone management plans prior to any OCS leasing and the desire to have State and local input into OCS leasing policy so that the goals of all parties are known and worked into the leasing program.

IMPACTS OF OCS LEASING

1. Several speakers expressed views on the socio-economic impact of increased OCS leasing. Those favoring leasing pointed out the economic benefits of providing more jobs and cheaper fuel costs, fulfilling the Nation's goal of energy self-sufficiency, and reducing the lag time between demand and supply to reduce curtailments of oil and natural gas. They also explained that large amounts of oil and natural gas are available in the OCS and that present industry technology concerning deep water drilling, blowout prevention, and oil containment and clean-up is adequate and safe.

2. Speakers opposed to immediate leasing expressed concern over the economic burdens placed on local governments and areas because of increased infrastructure required to support offshore development. They also voiced doubt as to the proven safety of offshore drilling technology, particularly deep water drilling, blowout protection, and oil containment and clean-up capabilities.

3. Numerous speakers expressed concern over the lack of knowledge of the specific impacts of oil pollution on biological communities, especially the effects of oil toxicity, sedimentation, water and air pollution, and noise on both humans and animals. They emphasized the need for detailed baseline information prior to any leasing.

4. Considerable testimony centered around the effects of offshore leasing on the aesthetics and recreational uses of beaches and other coastal areas.

5. Numerous speakers called for an in-depth cost-benefit analysis of OCS development before any leasing program is implemented in order to prevent the establishment of a program with net energy and economic loss.

6. A number of speakers also expressed ideas on the multiple use of the OCS including such activities as mariculture, recreation, development of other OCS resources, commercial fisheries, use as a National oil and gas reserve, and Federal consistency with the Coastal Zone Management Act.

COMPLIANCE WITH NEPA AND CEQ GUIDELINES

1. Various speakers expressed the need for further studies and reissuance of a more concise draft statement which more adequately meets the requirements of NEPA and the CEQ guidelines. They felt the present statement was too generalized, did not cover all required areas of concern, and was not planned in conjunction with a national energy policy.

2. Several speakers felt that the decision to lease additional OCS acreage had already been made and that the public hearings were no more than a false effort to satisfy the legal requirements of NEPA.

REGIONAL ISSUES

In addition to the general issues that were raised at all three hearings, there were issues of regional importance. In Alaska, the socio-economic and environmental impacts were of major concern. These included the possible effects development would have on small communities, tourism, fisheries, and migrating birds and mammals. Related to this was the CEQ's study rating the Gulf of Alaska as the highest risk area but Interior rating the area as number 1 for leasing. Due to the geologic hazards and extreme weather conditions, several speakers felt adequate technology was not yet available for this area. Industry representatives, on the other hand, said technology was available but also suggested a longer lease time because development would be seasonal. A 5-year moratorium was suggested for the Bering Sea due to the need for information on the ice-dominant system and the fact that the Bering Sea's high productivity contributes to the more northern waters.

Additional issues included, (1) the need for State and local input into leasing decisions, OCS Operating Orders, and Geological Survey's issuance of waivers to the industry; (2) the public availability of industry's data; (4) the need to discuss the provisions of pipeline impacts, and (5) the development of only one area at a time.

At the California hearing, several regional issues were brought forth. Among these were: (1) geologic hazards should be addressed more completely, (2) the OCS should be left alone so that future generations may enjoy it, (3) Santa Monica Bay should be made a national park, (4) the "energy crisis" is a illusory situation created by the oil companies, and (5) the Geological Survey is not qualified to oversee offshore drilling operations.

Issues discussed at the Trenton, New Jersey hearing were similar to the preceding ones. Speakers variously felt that the industry's data should be publicly available, the OCS should be left alone so that future generations may enjoy it, and that the Geological Survey was not qualified to oversee offshore operations. The deregulation of natural gas was suggested along with the possibility of developing high potential natural gas areas before extensive OCS exploitation. Some speakers said the Department should reevaluate currently "shut-in" wells and leases.

A significant amount of environmental and socio-economic information was submitted by various hearing participants. Much of this material was helpful in preparing the final EIS, however the detailed and parochial nature of the data makes if more suitable for inclusion in site-specific environmental assessments.

4. OTHER PUBLIC COMMENTS

The issues raised from the comments received from the public, but not for the hearing record, included the same issues brought forth in the hearings. Only one additional issue was offered - the use of dowsing for oil exploration.

The California State Attorney General forwarded to the Department several thousand letters from California residents who generally opposed any OCS oil and gas leasing offshore California. This write-in effort was coordinated by the Seashore Environmental Alliance (SEA) and sought to convey the breadth of citizen concern over OCS development. The transmittal letter from Attorney General Evelle Younger, and a sample of the form letter are found on the next two pages.

Following these two pages is a summary of the set of comments submitted by the Natural Resources Defense Council, Sierra Club, The Environmental Policy Center, South Carolina Environmental Coalition, Save of Georgia, New England Fisheries & Conservation Committee, Alabama Conservancy, and North Carolina Conservation Coalition. The summary was compiled by these organizations; the Department's comments follow the summary.

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CHIEF ASSISTANT ATTORNEY GENERAL
DIVISION OF CRIMINAL LAW

November 1, 1974

The Honorable Rogers C. B. Morton
Secretary of the Interior
Interior Building
C Street between 18th & 19th Streets, N.W.
Washington, D. C. 20240

Re: Offshore Oil and Gas
Drilling in California

Dear Mr. Secretary:

Enclosed are a large number of letters which we have received opposing the proposed offshore oil and gas drilling off the Southern California Coast. I would also like to take this opportunity to emphasize the absolute necessity for the federal government to comply with the National Environmental Protection Act and to complete the program Environmental Impact Statement process prior to proceeding any further with the decision making process regarding the Outer Continental Shelf off Southern California.

Respectfully yours

Evelle J Younger

EVELLE J. YOUNGER
Attorney General of the
State of California

fp
Enc.

cc: The Honorable Gerald R. Ford
President of the United States

Mr. Robert Hartman,
Special Counsel to the President

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NOV 7 RECD

Attorney General Evelle J. Younger
Office of the Attorney General
Department of Justice
State Building
Los Angeles, California 90012

Dear Attorney General Younger:

This is to let you know that I am opposed to the proposed federal offshore drilling along our California coastline.

I urge you to seek an injunction against the issuance of federal leasing of oil tracts in the California waters. I further request that you take any legal actions you deem appropriate to prevent the offshore drilling and help preserve our coastline.

Many thanks.

Sincerely,

Name ______________________________

Address______________________________

City, State & Zip______________________________

____
Date Signed

Please return this letter to SEA and we will turn over all of these letters to the Attorney General at one time.

Mail to: SEA - Post Office Box 3539 - Santa Monica 90403

Comments of
The Natural Resources Defense Council,
The Sierra Club,
The Environmental Policy Center,
South Carolina Environmental Coalition,
Save of Georgia,
New England Fisheries & Conservation Committee,
Alabama Conservancy,
and
North Carolina Conservation Coalition
on
The Bureau of Land Management's
Draft Environmental Statement (DES 74-90)
for the proposed Increases in Acreage to be
Offered for Oil & Gas Leasing on
the
Outer Continental Shelf

SUMMARY

1. The Draft Environmental Impact Statement, instead of effectuating the Congressional purpose in NEPA that environmental impacts and alternative actions should be systematically examined in aid of rational Federal decision-making, constitutes only pro forma compliance with the statute in relation to a decision arrived at months before the Draft Statement was prepared.

2. The Draft Statement does not evaluate, and indeed the Department of the Interior is not in a position to evaluate, the proposed accelerated OCS leasing in terms of its energy supply potential, on account of lack of essential information. OCS development should break away from the traditional Government pattern of lease first, learn later. To provide the Government with adequate information on which to base judgments about OCS petroleum resources and the advisability of production in particular areas, one of two new approaches should be adopted: either (1) exploratory drilling by contract for the Government before leasing, or (2) a separate decision by the Government on production for each tract that is leased (with initial leasing for exploration only). Moreover, with adequate information the Government could expect to secure appropriate prices for its sales of the national resources.

3. The Draft Statement contains no systematic analysis of how national energy requirements are to be estimated, on the basis of what assumptions regarding a Government energy policy and measures of conservation, and with what quantitative results.

4. The Draft Statement is grossly inadequate in the consideration of energy sources alternative to OCS oil and gas. It simply accepts as policy that the U.S. should proceed to develop and deplete as rapidly as possible the OCS resource, whatever it may later be found to consist of and regardless of the effect of such a policy on resort to other possibilities, including secondary and tertiary recovery from wells in the continental United States.

5. Adequate environmental baseline studies do not exist and cannot be made before leasing OCS tracts and turning them over to industry for exploration and production. Proper studies should be made during an exploratory phase before decisions on production.

6. The Draft Statement's treatment of coastal-zone environmental and economic impacts is sketchy and sometimes misleading, being often based on selective borrowing from the CEQ report of April 1974. The Draft does not take proper account of wetlands and their key ecological importance. There is no serious cost-benefit analysis of the accelerated leasing program, and there cannot be in the absence of the necessary

basic information being available. If the Government's decisions on production could be postponed until a reasonable data base is obtained, realistic and effective coastal zone management plans could be developed.

7. In regard to specific regions, the Draft Statement's treatment of Alaska is far from thorough on meteorological conditions and simply glosses over the many unknowns of biological systems in Alaskan waters. The treatment of Southern California is cavalier in regard to the earthquake hazard, including standards for the survivability of platforms and pipelines. The discussion of the Gulf coast is misleading in seriously understating the existing problem of water pollution from OCS petroleum production. In dealing with the Atlantic region, the Draft fails to consider possibly decisive impacts of further industrial development on the already heavily taxed coastal waters and resources.

8. The Draft Statement is deficient in examining the importance of pipeline corridors to environmental protection and to rational coastal planning.

9. The Department of the Interior had undertaken to include thorough treatment in the Draft of the technological problems of production operations in water depths beyond 200 meters. The product here is scattered and heavily disappointing. There is a lack of serious and detailed analysis of many problems called to the attention of BLM months ago. The Draft contains mainly reiterations of assurances apparently received from the industry.

10. The Draft Statement does not discuss the advisability and importance of the relevant regulations requiring use of the best available technology. This is a glaring omission.

11. The discussion of enforcement of OCS regulations is very weak. Already, Interior has not the qualified manpower to do an effective job of supervision and enforcement. An accelerated OCS program would make the situation much worse. The Draft Statement does not consider ways of coping with this already very serious problem and of making safety and environmental enforcement real on the OCS.

The Natural Resources Defense Council (NRDC), Sierra Club, the Environmental Policy Center, South Carolina Environmental Coalition, Save of Georgia, New England Fisheries and Conservation Committee, Alabama Conservancy, and North Carolina Conservation Coalition

The organizations noted above submitted an integrated document related to the accelerated leasing program and DES. The NRDC and Sierra Club had separate components of the entire document, while the remaining groups were represented by a third component. The comments submitted are extensive and have not been reproduced in full. The set of pages immediately preceding is the summary that was provided by the organizations for their document. Representatives of several of these prominent organizations testified orally at one or more of the public hearings held on the proposal. Complete copies of the document presented and oral testimony are available at the Washington Office of BLM; hearing testimony is also available at the BLM field office in the locality of the hearing.

Disposition

1. No decisions have been made to either proceed with the acceleration of OCS leasing as proposed by the lease sale planning schedule or for any frontier areas on the schedule (except the recent South Texas sale, which was proposed on an earlier planning schedule). To aid in decision-making, all areas of the OCS that have hydrocarbon

potential are characterized in a systematic fashion in Section III of this EIS regarding their relative natural hazards, oil spillage potential, highly valued resources and resources unique to each area, and proximity of development to highly valued coastal resources. These parameters are combined into a characterization of each OCS area in terms of environmental risk of development. The characterizations thus obtained are then used in developing alternative leasing strategies, and identifying possible trade-offs in decision-making. No decisions will be made on whether to accelerate or to what degree to accelerate leasing until the public and the Department have reviewed this final EIS. The public will be permitted to comment on the final EIS, as well as the Program Decision Option Document that is being prepared.

2. While it is true that accurate evaluations of reserves in frontier areas can not be made without exploratory drilling, estimates of reserves can be made on the basis of existing geologic and geophysical information. This final EIS utilizes recent estimates published by the USGS (which are in the general range of the estimates also recently published by the National Research Council through the National Academy of Sciences) in a systematic manner to estimate the possible intensity of development in each

OCS area and the possible level of oil contamination that would result from such development. The environmental impact statement considers the environmental consequences of programmatic changes that would require legislative approval (such as amending the OCS Lands Act to segregate exploration and production) in Section VIII on Alternatives.

3. Neither the draft nor the final impact statement makes a systematic analysis of how national energy requirements are estimated or on what assumptions Government energy policy is to be based. The focus of an impact statement as explained by the CEQ Guidelines (Federal Register August 1, 1973) leads us to conclude that issues of the above nature are beyond the scope of our environmental assessment.

   However, the Project Independence report, which was not yet available when the draft EIS was published, is frequently cited in the final EIS as the most recent and comprehensive attempt to define national energy requirements now and in the future, as well as methods of supplying our energy needs domestically or from secure foreign sources. Energy conservation, on the other hand, is a viable alternative to increasing OCS leasing, and is the focal point of Section VIII on Alternatives. Project Independence, the Ford Foundation Energy Policy Project report and other sources are used extensively in the discussion on conservation.

4. The discussion of energy alternatives in the final EIS makes extensive use of the Project Independence Blueprint, the Ford Foundation's A Time to Choose, and the recently completed study of energy alternatives done by the University of Oklahoma. The energy alternative portion begins with a discussion of the various impacts conservation can have on national energy demand. Secondary and tertiary recovery enhancement due to current prices is also discussed.

5. Environmental baseline studies are parts of a larger studies program which attempts to identify the effects of OCS development. Where newly collected data augments a literature data base, these data are incorporated into site-specific impact statements. The environmental studies program was not designed to evaluate areas before they are offered for leasing. However, in some instances, it is possible that preliminary results from baseline and monitoring studies will be available prior to production phases, should commercial quantities of oil and gas be discovered. In such instances, this information, when relevant,

would be used in evaluating the development plans which the lessee is required to submit to the Geological Survey for approval.

6. It was not our purpose in preparing this programmatic environmental impact statement to focus on the very detailed impacts that could result from a small element of a large proposal. This will be the focus of site-specific impact statements which will be prepared on each proposed sale in the accelerated leasing program, if it is decided to proceed. However, the final EIS presents the impacts of development in a generic fashion, and analyzes the differentiable impacts for each OCS area in a systematic method so that characterizations of each area in terms of environmental risk of development can be made. Alternative leasing strategies are then developed based on risk of development, and the alternatives of conservation, no acceleration of OCS development, and other energy sources are also discussed.

A cost/benefit analysis has not been incorporated in the FES. The purpose for preparing an EIS is principally to provide decision makers and the public with the environmental consequences associated with a proposed action, given the best available information, and the alternatives to it. It is not intended to be an overall decision-making document. The FES provides a description of direct and indirect environmental effects, and places the proposed action in a functional and socio-economic context. It is left to the decision maker to compare and balance economic, technical and alternative considerations and ultimately to decide the issue. To engage in formal economic cost/benefit analysis in the environmental statement itself, would tend to obscure environmental anaysis by transforming the statement into an overall decision making document centered around economic considerations and having a program justification focus.

7. It is felt that the area-by-area analysis of impacts in Section III of the final EIS gives very pointed treatment to meteorological and seismic hazards in the Gulf of Alaska and the seismic hazards in the Southern California area. Existing water quality problems in the Gulf of Mexico and Atlantic are now given more extensive treatment in Section II on Description of the Environment. We agree that information regarding biological systems in Alaska is scant. Information of a descriptive nature is also incomplete. However, we have described the offshore biota in Section II.A.4.d, and have indicated the lack of detailed information.

A somewhat more detailed description of the coastal biota is given in Section II.B.4.b. However, again as indicated in 3rd paragraph, in-depth knowledge is lacking in this region also.

8. Section I under Program Management discusses the cooperative efforts of the Federal Government and the states of Florida and Alabama in delineating pipeline corridors. The Department feels that the corridor concept is a valid one and has committed itself to working with each and every State that anticipates transportation of oil and/or gas via pipeline into its waters and onto its lands in order to rationally plan for these activities.

9. Additional information has been acquired from the USGS, which recently initiated a study on the state-of-the-art of subsea completions. The information has been incorporated into Section I.B. on Operations. Also, new information has been added regarding deep water work in the North Sea. However, deepwater operations remain a problem that has not undergone the rigors of field testing. A deepwater tension leg platform is expected to be tested by Continental Oil in the near future on the Louisiana OCS, where several deepwater tracts have been leased. Additional information produced at the recent hearing on OCS Sale #35 in California on deepwater and subsea production has also been added to the text.

A strategy of "leasing to learn" is discussed in Section VIII on Alternatives. Briefly, this leasing strategy would offer limited acreage in areas of specific natural hazards (ice, seismicity, deep water) but where other environmental risks are minimal and resources are not highly threatened. Leasing would proceed in other areas with the same natural hazards only when the technology for handling conditions in an environmentally responsible manner had been demonstrated.

10. The problems of the phrase "best available technology" were discussed at the end of Section VIII on Alternatives in the draft EIS. This discussion has been expanded and shifted to Section I on Management in the final EIS.

11. The USGS, which has supervisory and enforcement authority over OCS operations, is committed to expanding its staff to handle any increased supervision and enforcement needs. By starting at a propitious time, USGS can be well prepared for any level of accelerated leasing, since the full weight of this responsibility under an accelerated plan will not be felt for several years, at least.

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